THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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NEWSPAPER

TOP OF THE NEWS

The price of processors acquired from third-party lessors is up, and users can blame it on the IRS, the Computer Dealers and Lessors Association said recently. In other CDLA news, members of the organization claim the requirements of a new IBM program are "like turning over your best prospect list" to your competition; the CDLA is threatening legal action. Page 2.

■

Although DP budgets are up this year, MIS executives want still more money for purchasing software and offering employee incentives, they told the Data Processing Management Association. Page 9.

■

A service that will allow users to reconfigure their networks dynamically was promised by AT&T Communications' service development director at Interface '84. Page 11.

■

The world's first downtown teleport for satellite communications is slated for midsummer completion in Washington, D.C. Page 69.

■

A multiuser supermini that boosts mainframe power and runs VM/CMS applications has been announced by a Connecticut firm. Page 75.

■

The No. 1 micro for running spreadsheets is Sanyo's MBC 5500, Auerbach Publishers says. Page 83.

■

Gone, almost forgotten — but reborn. Renamed Programaster, Raytheon Computer Services' Readycode is now being marketed by a spin-off. Page 99.

■

Gould's first virtual CPU targets VAX

By Jamie Connolly
CW Staff

FORT LAUDERDALE, Fla. — Gould, Inc.'s Computer Systems Division last week announced its first virtual memory processor, a 32-bit machine that supports Unix and targets the Digital Equipment Corp. VAX-11 market.

Powernode 6000 operates under Gould's UTX/32 operating system, which includes features of both Bell Laboratories' System V and the University of California at Berkeley's BSD 4.2 versions of Unix. Gould said this Unix-based software can accommodate applications developed for a VAX environment.

The processor was designed for networked and stand-alone multiuser applications and is available in three basic configurations: the PN6030, the PN6050 and the PN6080 dual processor. The units were developed for software development as well as for scientific, engineering, military, aerospace and educational applications.

The Powernode 6000 line is said to process compute-intensive tasks while allowing simultaneous workstation access to data bases. Gould claims the Powernode 6000 has outperformed the VAX-11/780, with the PN6030 and PN6050 operating 1½ to two times faster and the PN6080 performing 2¼ to three times faster than the VAX-11/780 using Unix.

The products were designed with the Gould Selbus, which offers a data transfer rate of 26.7M byte/sec. The Selbus is also used in the firm's larger Concept line of processors.

See GOULD page 4

Local-area nets still far off: Interface poll

By John Gix
CW Staff

LAS VEGAS — If sheer numbers alone tell the story, local-area networks are still only a possibility for most users and an evolving solution for the avant-garde few that have installed them.

That was the message gathered from a random selection of attendees queried at the Interface '84 conference here last week.

Sessions on local-area networks commanded standing-room-only attendance, but few of the conference participants polled said they were actually using the products. Organizations that have installed local nets reported varying degrees of satisfaction.

Kenneth Sumner, program manager of General Electric Co.'s Corporate Information Systems group, believes it will be a couple of years before local-area network technology becomes as competent as the vendors selling it.

GE has many local networks in place, but the largest one is an Ungermann-Bass, Inc. Net One. Consisting of four network segments interconnected with repeaters, this network is used to provide host access to between 8,000 and 9,000 terminals, Sumner said.

Sore points of GE's network development included growth problems and the need to keep current with the vendor as it was evolving its product line. Heavy interaction with the vendor was required to iron out some system wrinkles, Sumner said, but he noted that this was due primarily to the fact that the product was still in the early stages of development.

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FYI

If you're looking for a great place to work . . .

By John Gallant
CW Staff

What could IBM possibly have in common with Walt Disney Productions, Hallmark Cards, Inc., Inland Steel Co., the Los Angeles Dodgers, Mary Kay Cosmetics, Inc. and the Reader's Digest Association, Inc.?

Despite the fact that they operate in widely disparate industries, all those companies are great places to work, according to the authors of a soon-to-be-published book called *The 100 Best Companies to Work for in America*. High-technology firms make up nearly a fifth of the 100 companies, which coauthors Robert Levering, Milton Moskowitz and Michael Katz say are rarely examined from an employee's standpoint.

After whittling an initial list of 350 companies down to 135, Levering, Moskowitz and Katz took to the road to interview employees and garner statistics about the firms. Each of the 100 companies finally selected, the authors say, has something distinctive to offer its workers, whether it be the million-dollar fitness center at Rolm Corp. or the employee vegetable garden at Control Data Corp.'s headquarters.



Along with the biggest "pluses and minuses" of working for each of the 100 best, the three have rated the companies on the basis of pay, benefits, job security, advancement opportunities and ambience. Big and small alike, most of the companies have fostered among workers an attitude of "we're all in this together."

Below are some of the high-tech firms that came under the trio's scrutiny:

■ *IBM* can make its employees feel like giants, the authors say. But those who don't abide by the industry giant's rules — laid down in a 32-page code of ethics — won't last long. According to the authors, few companies of any size can match the benefits or the job security that Big Blue offers. The authors add that IBM is a world unto itself — a world where secrecy is the hallmark. And in that world filled with ardent believers, the nonbeliever may not be very comfortable.

■ You'll get the opportunity to work with a lot of "brainy people" if you're hired by *Hewlett-Packard Co.*, but the authors warn that you may be handicapped if you don't have a degree in electrical engineering or if you're a woman. HP is a model of how a company can grow, prosper and still maintain a personal feeling, the trio writes, and workers are impressed with the company's "playful" atmosphere. Employees enjoy good pay and a good working environment — not to mention the 10 recreation areas HP owns.

■ Work at *Apple Computer, Inc.* and you'll feel like a trailblazer. There's a pot of gold at the end of your trail at Apple, the authors say, but in the end you and the company may be "munched to death by Big Blue." Levering, Moskowitz and Katz claim that Apple's high morale attracts many to the firm, and a subtle 1960s youth

See GREAT page 4

NEWS

CDLA blames IRS probes for cost hikes

By John Kirchner
CW Washington Bureau

ACAPULCO, Mexico — End users are now paying more for computers because of the current Internal Revenue Service investigation of two large third-party vendors, several members of the Computer Dealers and Lessors Association (CDLA) claimed here recently.

As part of a larger review of tax shelters, the IRS announced a few months ago it is investigating the "wraparound" leases and other "tax-advantaged" deals of Comdisco, Inc. and Finalco Corp. The audits are still in process.

Since then, according to the CDLA, investors who provide capital for third-party vendors in return for lease income and various tax advantages have been taking extra precautions and shying away from anything but the safest third-party deals, which do not afford the best rates for end users.

"The threat of an IRS audit is very damaging when you're trying to solicit an equity investment," CDLA President Richard A. Forsythe, who is president of Forsythe/McArthur Associates, Inc. in Chicago, said at the recent association meeting here. "It has become temporarily difficult for promotors to solicit investors. . . . As a result of that, the price of leasing a computer has gone up."

As an example of the effect the IRS investigation is having, association vice-president Robert A. Gulko, president of Unicom Computer Corp. in Sausalito, Calif., said that an end user leasing a $500,000 IBM 4341 is probably paying about $500 a month more on a four-year lease or $1,000 a month more on a two-year lease than he would have paid before the IRS action.

One reason for the price jump, Gulko explained, is that the overhead costs of preparing computer deals are "astronomical compared to what they were." Investors are insisting on much more legal and accounting work on each deal to protect themselves from IRS scrutiny. Moreover, because of "the uncertainty in the investor marketplace, we're seeing transactions that appear to be good, honest deals . . . falling apart."

Although prices for such deals always increase after the year-end rush to close tax-advantaged transactions, "the magnitude of the rise is much greater because of the IRS," Gulko said.

Forsythe speculated that the IRS would not act against the two companies unless it found they had overinflated the value of the equipment in their deals or if they had included fraudulent claims in their prospectuses.

But, he added, the IRS probably cannot give these types of transactions a completely clean bill of health and still continue its campaign against tax shelters. He predicted an eventual "have fence, will straddle" statement from the IRS that will clear the companies but still "leave a little fear of God in the investors' minds."

Lessors fighting new IBM rule

By John Kirchner
CW Washington Bureau

Members of the Computer Dealers and Lessors Association (CDLA) are contemplating legal action against IBM to halt what the association feels are anticompetitive actions by the computer maker.

The dispute concerns a three-month-old IBM "end-user certification" program, in which the firm requires all equipment buyers to state 30 days before delivery who will ultimately use the machinery. Third-party vendors — which are IBM's biggest customers — fear that disclosing to IBM who they are dealing with will allow IBM to try to "unhook" those deals in favor of a direct procurement from IBM.

"That's like turning over your best prospect list" to your competitor, remarked CDLA Executive Director James F. Benton. Added CDLA President Richard A. Forsythe, "It seems to us to be dirty pool."

While CDLA members said they do not know of any IBM attempts to take advantage of the situation to swing deals to IBM Credit Corp., they claimed the possibility is there. CDLA . Vice-President Robert A. Gulko, who is president of Unicom Computer Corp. in Sausalito, Calif., said IBM sometimes offers a better delivery date to a customer it knows is negotiating with a third-party vendor.

The association executives said the new program is monopolistic and possibly in violation of the 1956 consent decree between IBM and the U.S. Justice Department, which in part said IBM cannot force equipment buyers — in this case third-party vendors — to disclose how the machines will be used.

IBM: 'Nothing new'

IBM, for its part, argues the program is nothing new. Company spokeswoman Nadine Fletcher explained at IBM headquarters that before December all volume buyers had to provide a certification. The new program merely brings all end users under that requirement, she said, noting third-party vendors have always had to disclose end users at some point so that the equipment could be shipped.

The change is necessary, she said, so that IBM can be sure it is treating equally all end users qualifying for volume purchases. "This is nothing new. This has been done all along," she said, adding, "In any event, end-user certification will not be used to disengage the leasing companies' leases."

The association and IBM are meeting to try to resolve the conflict, short of taking the matter to the Justice Department or a federal court. Forsythe said recently that "if there is no business solution to it, you will see some litigation."

Both parties expressed optimism that the matter will be resolved amicably within the next few months. Asked if IBM thinks the dispute can be settled by the talks, Richard M. Hayden, IBM director of industry relations, said, "It's in process right now; it's not too appropriate to comment. Obviously, we hope so."

If some legal action does ensue, it would have to come from an individual company claiming to have been damaged by the program rather than from the association, Forsythe said. According to a CDLA executive, "there are several large members with large resources" ready and willing to take on IBM in court.

Forsythe estimated CDLA members will buy between $5.5 billion and $6.5 billion worth of IBM products in 1984. "While we may have terrible differences with IBM, and we do, and while IBM may have terrible differences with us, and it does, we are not sure we want to call off the game," he said. Because of the association members' large investment in IBM equipment, they are concerned about the company's health, he said.

"As an American, I would love to see IBM prevail in the world computer market," Forsythe said. He added, however, that with increasing Japanese presence in the U.S. marketplace, and with a large unregulated market in telecommunications equipment developing, third-party vendors may find businesses with products that are more attractive than IBM products, especially if they feel IBM is making it difficult for dealers and lessors. For now, he said, the two parties need each other.

Speaking of IBM-CDLA relations in general, Forsythe said, "IBM is a legitimate corporation. It's not going to take unfair advantage." He added, however, that the certification program is just one more action in a long line the association and end users find objectionable and overbearing.

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Interface '84: No blockbuster announcements, but a number of communications products were introduced . . . Snet's chief says the White House will propose a new national telecommunications policy as soon as warring communications factions reach a consensus . . . AT&T Communications' service development director promises a new private network service by the end of the year . . . McAuto tells how it is controlling the internal use of personal computers/10-12

The Computer-Based Training Conference & Exposition: The increase in the growth of information centers during the last three years has usually occurred under the watchful eye of the MIS department in an IBM environment, according to a study detailed at the conference . . . A CBT specialist related his experiences in developing a cost-effective training strategy for Arthur Andersen & Co. . . . A consultant alerted DP trainers to the risks inherent in implementing CBT/14-16

The candidates who don't use computers in their campaigns probably will see their opponents using one, warned speakers at the Annenberg Schools of Communications' Washington Program on Communications Technologies and Politics . . . A political consultant tells how candidates can reach out to multiple sources to collect information that will target friendly voters . . . Republicans lead their Democratic opponents in use of major computerized data bases, but the Democrats are fighting back with microcomputers at the grass roots level/17-19

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A manufacturer of strapping systems is using a financial modeling and analysis package to improve planning and tighten cash-flow control/29

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NEWS

Gould adds Concept 32/97, its largest CPUs to date

By Tom Henkel
CW Staff

FORT LAUDERDALE, Fla. — Gould, Inc.'s Computer Systems Division last week unveiled its line of largest processors, the Concept 32/97 series. Available in three basic models, the supersinis are said to offer a maximum internal throughput of up to 10 million instructions per second (Mips).

Designed for scientific and engineering applications, the entry-level Concept 32/9705 boasts a four-stage instruction pipeline architecture and 4M to 16M bytes of main memory. It reportedly sports an internal performance of 4.67 Mips and comes with a standard 32K bytes of cache memory, which can be doubled with a 32K-byte expansion module.

Gould also announced a 128K-byte Shadow Memory Module which can be used in place of the 32K-byte cache memory expansion module. A user-definable cache memory option, the Shadow Memory Module can improve a user's performance in applications that require a predictable outcome, Gould said.

The 32/9705 CPU cabinet contains two chassis. A CPU/Logic chassis has a total of 38 slots including 21 CPU slots and 17 slots for attachment of devices under the firm's Selbus. Fourteen Selbus slots are available for expansion beyond the 32/9705 configuration.

The second chassis, the I/O Expansion Chassis, offers eight slots plus a line/printer floppy controller and a diagnostic processor.

An intermediate model, the 32/9750, is virtually identical to the 32/9705, but offers 18 additional I/O slots for applications that require additional interfaces or I/O devices. Both the 9705 and 9750 are field-upgradable to the top-of-the-line 32/9780 system.

The 32/9780 is a tightly coupled multiprocessor which Gould said offers internal performance of approximately 8.4 Mips.

Like the 32/9705, the 32/9780 offers 4M to 16M bytes of main memory. It consists of a central processing unit and an internal processing unit. Both processors carry equal processing power, noted Gould's Hank Taylor, manager of product planning; if one processor fails, the remaining processor can take over the entire processing load.

Each of the two processors in the 32/9780 is equipped with 32K bytes of cache memory, which can be expanded to 64K bytes per processor. In addition, each processor can accommodate one or two Shadow Memory Modules, making the shadow memory capacity 128K or 256K bytes.

Besides announcing the processors, Gould last week unveiled a Multiply Accelerator option for the 32/9705, 32/9750 and 32/9780. The feature is a two-board performance accelerator incorporating both floating-point and fixed-point processors. According to Taylor, the Multiply Accelerator adds an extra 1 Mips of performance to the processor.

The 32/9705 and 32/9750 can accommodate one Multiply Accelerator, and the 32/9780 can handle two units. A 32/9705 equipped with the Multiply Accelerator has an internal performance of roughly 5.6 Mips; a 32/9780 configuration equipped with two Multiply Accelerators offers a maximum internal throughput of 10 Mips, Taylor said.

Like other members of the Concept 32 line, the 32/97 models support Gould's proprietary MPX-32 real-time operating system. They also support Gould's version of the Unix operating system, called UTX/32.

An entry-level, 4M-byte 32/9705 costs $245,000. The price of the 32/9750 intermediate processor begins at $329,000, and the 32/9780 has an entry-level price of $509,000. A top-of-the-line 32/9780 system with dual Multiply Accelerators and 128K bytes of cache memory costs $495,000.

The processors are available 90 days after receipt of order. Gould's Computer Systems Division is located at 6901 W. Sunrise Blvd., P.O. Box 9148, Fort Lauderdale, Fla. 33310.

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The Powernode 6030 can support 2M to 6M bytes of main memory. The larger Powernode 6050 and 6080 accommodate up to 16M bytes of main memory. Other features of the Powernode 6000 family include 32K bytes of dual cache memory per processor, four-stage instruction pipeline, instruction and operand prefetch and base register support, Gould said.

Communications features reportedly include the Department of Defense's standard Transmission Control Protocol/Internet Protocol for interaction within a Unix-based network and the ability to link with Xerox Corp. Ethernet networks.

One feature of the Powernode processors that Gould claimed offers users a distinct advantage over the VAX is their size; a spokesman noted that the processors occupy about one-third the floor space of a VAX. For example, the PN6030 is packaged in a cubed cabinet 30 in. on a side. An 80M-byte Winchester disk drive and a removable 60M-byte magnetic tape cartridge drive are integrated in the 30-in. cabinet.

The more powerful PN6050 is packaged in a 71- by 29- by 30-in. cabinet. The unit is field-upgradable by adding expansion boards and peripherals to the top-of-the-line PN6080.

Gould said only the PN6050 is field-upgradable to the PN6080. This is done by adding a Gould internal processing unit to the PN6050, resulting in 80% more processing power, according to the company.

Prices for the PN6030 start at $80,000, for the PN6050 at $115,000 and for the PN6080 at $150,000. The products are available within 90 days of receipt of order, according to Gould's Computer Systems Division, which is based at 6901 W. Sunrise Blvd., Fort Lauderdale, Fla. 33310.

Bell Labs, HP and IBM among the 10 best places to work

Among the high-technology companies, which are the best of the best employers?

According to the authors of *The 100 Best Companies to Work for in America*, Bell Laboratories, Hewlett-Packard Co. and IBM are among the 10 best U.S. firms for workers.

Only HP is listed among the 10 best paying companies, and Apple Computer, Inc., Bell Labs and IBM are among the 10 best for benefits.

When it comes to job security, Digital Equipment Corp., HP and IBM are among the prestigious 10 best. Tandy Corp. and IBM are represented in the list of the 10 best companies for job advancement.

But what about the truly important things in life, such as ambience? If it's ambience that you want in a high-tech firm, then you should apply to Apple and HP, say coauthors Robert Levering, Milton Moskowitz and Michael Katz. If you're looking for a company with a country club, send your resume to IBM, which maintains two such recreational facilities that employees can join for just $5 a year.

Which companies are noted for throwing the best employee parties? HP and Tandem Computers, Inc., where the authors say the Friday afternoon "beer bust" has become a hallowed tradition. Control Data Corp. gets the high-tech nod for best employee vegetable garden, and Rolm Corp. and Tandem Computers rate among the best for company-paid sabbatical plans.

If you're looking for the best vacation plan, you're in the wrong industry. No company can beat Reader's Digest Association, Inc. for vacations, the authors say. Besides, who could complain about working in a place called Pleasantville?

GREAT from page 1

culture pervades the work place. Not everyone fits in with the microcomputer giant, but those who do benefit from Apple's strong "share the wealth" attitude.

Vegetable garden notwithstanding, *CDC* is a "leader in corporate social responsibility," the authors report. CDC does not exactly attract flamboyant employees, but is more a haven for "YMCA-type do-gooders — provided they possess a strong Calvinist interest in making money." CDC doesn't believe in the relaxed and informal atmosphere of Silicon Valley high-tech firms; suits and ties are a must. But workers are also able to take advantage of the company's extensive employee assistance programs.

People communicate on a first-name basis at *Digital Equipment Corp.*, according to the authors, but for a large organization, DEC lacks structure. DEC is described as an "Eden for engineers," but the "looseness" of the company offends those engineers who want things run by the book.

Send your resume to *Bell Laboratories* if you want to work at what Levering, Moskowitz and Katz describe as the "frontier of knowledge." But there's a tension at the company which derives from the desire to do research and the need to produce a product for the parent company — AT&T. You probably won't get hired anyway; some workers say you have to be able to walk on water just to get to the interview stage.

The 100 Best Companies to Work for in America, scheduled for release this May, will be published by the Addison-Wesley Publishing Co., which is located in Reading, Mass. 01867.

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Big Apple at the core of bypass technology

By John Dix
CW Staff

NEW YORK — New York is perhaps the single best place to put a finger on the pulse of "local bypass" — local telecommunications services provided by companies other than entrenched telephone companies.

Because of the heavy communications traffic generated by the high concentration of corporations on the two- by 13-mile island of Manhattan, this city has become a proving ground for bypass technologies. Today the Big Apple is home to the most successful CATV-type data service, as well as the first operational digital termination system (DTS) in the country.

While still a neophyte industry even here, bypass is causing New York Telephone to take furtive glances over its shoulder and has spurred ambitious plant construction plans that the telephone company hopes will help it meet bypass' challenge.

MCTV spearhead

Spearheading that challenge are Manhattan Cable TV (MCTV) and Local Area Telecommunications, Inc., companies with operational bypass systems in place. MCTV, which began experimenting with data services in 1974, operates a CATV-type data network that is separate from its entertainment network. The two networks are managed and maintained by individual staffs.

Carl Gambello, MCTV's director of corporate development, said that the data network generated $1 million in revenues in 1983 (as opposed to the nearly $40 million made by the entertainment side of the house). The services it offers include point-to-point and multipoint data links supporting both asynchronous and synchronous traffic at speeds that range from 1,200 bit/sec to 1.54M bit/sec. Service fees are charged at a fixed monthly rate depending on the protocol used and the data rate.

Most of MCTV's bypass customers are using 9,600- and 19.2K bit/sec circuits, but recent requests have been for the 56K and 1.54M bit/sec service, Gambello noted.

A user that wants to tap into MCTV must absorb the cost of installing the link between its building and MCTV's trunk cable. That can be an expensive proposition. Depending on how close the trunk is, street-cut costs alone can range from $6,000 to $12,000. Running wire up inside a building to the appropriate location will cost an additional $550 per floor, Gambello said.

This type of commitment means that the service will be attractive to customers who can absorb the initial connection costs and see the long-term benefits of using cable. According to Gambello, the benefits of using MCTV's bypass service include contracts that can be as long as three or four years (particularly significant now, given the rate fluctuations of other services); high-speed services; a guaranteed bit-error rate of 10^{-9}; an estimated 99.9% uptime and a two-hour response to service calls; and the provision of service to customers within a maximum time frame of 90 days.

As an alternative to New York Telephone, MCTV provides only local data services and does not presently interconnect with any other carrier. Gambello said, however, that discussions have taken place with Satellite Business Systems, MCI Communications Corp. and ITT about the possibility of interconnecting their long-distance facilities with MCTV. He anticipates that a deal with one of these companies will be made within a year.

A newer company than MCTV, but one chasing the same carrot, is Local Area Telecommunications, Inc. (Lati). Lati began operation last year as the first DTS carrier in the country to bring its service up.

The company's first node in New York is located on top of the World Trade Center. From an antenna there, microwave service is provided to users with small send/receive antennas. Dedicated links' services include the usual data rates ranging from 1,200- to 1.54M bit/sec and above.

Lati President Perry Spirakis would not disclose his company's revenues nor its number of customers, but he said that the Securities Industry Automation Company, a subsidiary of the New York Stock Exchange, was its first client and presently leases 10 9,600 bit/sec circuits.

Spirakis eventually hopes to operate three or four interconnected nodes in New York.

Cutting them off at the pass

Lati and MCTV are carriers that hope to compete with New York Telephone in what Bob Helgesen, division manager of network planning for the telephone company, calls "economic bypass" — competition based on the cost of providing service.

Helgesen believes the best defense against bypass is a strong offense: "We must avoid providing incentives for bypass, and the best way to do this is to install the best technology available where it is most strategically needed."

Demand in the telephone business is traditionally felt at the central office, the switching point at which all telephone lines terminate. Because of this reality, the weak link in the system is seen as the trunks between central offices, which had limited capacity.

To breach that bottleneck, New York Telephone decided to interconnect its many switching centers in the city by installing fiber-optic cables. This would enable the carrier to offer higher speed services to its users while passing on some of the benefits of this type of medium — among them low-bit error rates and bandwidth enough to conduct video-conferences.

Fiber-optic projects

The first fiber-optic project undertaken was the Ring Around Manhattan, a 144-fiber cable that runs 13.2 miles and was completed in early 1983. The capacity of that system was used up so quickly, Helgesen said, that two other projects were soon launched:

- The Video Around Manhattan (VAM) project was designed as an overlay and upgrade to the first ring. Scheduled to be completed in the second quarter of 1985, VAM will include 20 miles of Western Electric Co. fiber cable (144 fibers per cable) that will operate at 135M bit/sec. NEC Corp. electronics will be used in that system.
- Also slated to be in operation by the second quarter of 1985 is the Fiber-Optics Around Manhattan (Foam) project. Representing a major upgrade to the other systems, Foam will consist of 12 miles of Siecor Corp. single-mode fiber cable (96 fibers per cable) driven by NEC hardware. Eventually, Foam will be extended to Staten Island, Queens and Long Island.

New York Telephone is still studying other transmission technologies like DTS, but Helgesen said that given the number of large office buildings in such a relatively compact area, fiber optics seems the way to go.

By upgrading its plant and pricing its services competitively, the company hopes to cut bypass carriers off at the pass.



Lament has familiar ring

BRIDGEPORT, Conn. — Phone users who are singing the blues over the AT&T divestiture now have a hit tune they can hum as they pay their bills. A parody of Neil Sedaka's 1962 hit, it's called "Breaking up is Hard on You."

In the two months since its release, 150,000 copies of the 45-rpm single have been sold nationwide, and the song has been listed as No. 76, with a bullet, on the *Billboard* magazine list of hit records.

But how could it miss, with words like these:

AT&T don't say goodbye
Don't want to use no MCI
You'll pay rates out the wazoo
'Cause breaking up is hard on you.

And these...

I beg of you, don't take my phone,
I want to lease, don't want to own.

Besides complaining of feared rate hikes, the song also takes a poke at phone company service:

Remember when you made a call
And you got through, no sweat at all;
Now you wait the whole night through
'Cause breaking up is hard on you.

The song was penned, reportedly in 20 minutes, by the American Comedy Network here in December and released to the 23 radio stations that regularly use the troupe's recordings of humorous skits and takeoffs on commercials. Radio stations were swamped with telephone calls when they played the song, according to the group's creative director, Bob James, who describes his six-member group's work as "humor with an edge on it."

The phone calls led to a recording contract with a small Boston label. The song James said had started out as "just a joke" was being played by as many as 250 radio stations.

AT&T Media Relations Manager Phil DeLong, meanwhile, said that the company has taken no position on the song, but he feels "bemoaning divestiture is a lot like beating on a dead horse.

"The song we're humming around here is 'Tomorrow'," he added.



Bank pleased with Teradata DBC/1012

Data base machine marks Wells Fargo debut as DBMS user



FIRST USER

By Paul Gillin
CW Staff

EL MONTE, Calif. — When Wells Fargo Bank N.A. installed Teradata Corp.'s DBC/1012 data base computer here in December, it marked two firsts: Wells Fargo became the first user of the large-scale machine and at the same time installed its first-ever data base management system (DBMS).

Wells Fargo has primarily used Vsam files for many years. While the company does not plan to replace that access method with the Teradata machine, it does expect to develop many of its future small- and medium-scale applications on the DBC/1012, particularly those requiring fast turnaround time.

"Wells didn't get involved in the [IBM] IMS mania of the early '70s," said Michael G. Rowloff, vice-president and district manager of the technical services district at Wells Fargo, in an interview from Wells Fargo's northern data center in San Francisco. "We still have over 100 [IBM] CICS applications using strictly Vsam files."

For new information systems requiring fast development, the department uses Information Builders, Inc.'s Focus fourth-generation language, which Rowloff said can be used to build applications in about one-sixth the time required for Cobol. However, DBC/1012's Tequel language makes prototyping and development about twice as fast as in Focus, he said.

Rowloff became interested in the data base machine when he attended a roundup sponsored by Teradata for potential users last year. "We felt they were excellent people," he said. "We were particularly impressed with their ability to achieve fourth- and fifth-level normalization. That was probably the key."

The Teradata computer's relational DBMS model and self-normalization features eliminate the need "to have a number of data base gurus constantly tweaking the system," Rowloff said. In addition, Teradata's claimed capacity of up to a terabyte — one trillion bytes — of storage presented unusual growth potential for a relational system, Rowloff said. "All my disk space combined is less than half a terabyte," he said.

That Teradata is a start-up company did not faze Wells Fargo, either. In fact, Teradata's offer of a four-month, no-obligation test period was superior to anything IBM offers, Rowloff continued. "We were willing to be the first users on this, but our attitude on IBM is not to be among the first couple of hundred," he maintained.

Wells Fargo installed the smallest configuration of DBC/1012 in December. It includes four parallel access module processors, two communications controllers and four Winchester disk packs totaling about 2G bytes of storage. Installation took about two days and presented no unusual problems, Rowloff said.

For its first application, Wells Fargo chose a data center management program that it tested internally, but soon opened the data base to the general programming community. One of the earliest applications included a "difference analysis" program in which about three million item processing balances were input and searched for discrepancies with daily transactions. Another application was a "combined management" program that provides information on accounts which have multiple relationships across divisional boundary lines.

Rowloff said he was surprised by both the speed and flexibility of the system. "We've run some jobs in the difference analysis program that have run in as little as 15 seconds," he said. "That surprised us because it would probably take as long as several minutes in an on-line environment."

Acid test

However, the acid test of DBC/1012 is still to come, Rowloff noted. Wells Fargo plans to install an accounts analysis system sometime in April. The system basically totals a customer's chargeable transactions for a specific period and matches it against the customer's account to determine how much he should be charged. "Essentially, it's a bank's bill of services," Rowloff explained.

The application will be the first to test the Teradata machine against a data base of more than 1G byte and an array of 160 rows by 120,000 columns. "We'll do some things that exercise a lot of that array and see how it does," Rowloff said.

One pleasant side benefit of the machine has been in the area of data security. Because of the relational tabular structure, "you can look at certain records but not at those owned by other [user] IDs," Rowloff said. "That's not available in Vsam and not done well in some older data base systems."

The future of DBC/1012 will probably lie in new applications that require fast turnaround. The company also expects to offer end users some limited programming functions (see story below).

"Our industry is a deregulating one," Rowloff commented. "We're looking at producing as many information products in a year as we have in the last five years put together. Something like this comes at the perfect time as far as getting products out the door quickly."

However, Rowloff reserved judgment on whether machines like DBC/1012 will eventually replace Vsam files. "There's a definite potential, but I don't think we're quite there yet," he said. "But we're carefully watching other companies that have put their production data base on this."

First user planning applications, end-user computing

EL MONTE, Calif. — Although Teradata Corp. claims its recently announced DBC/1012 data base computer is capable of handling large production-scale processing, the first user of the new machine has no plans in that area.

Instead, Wells Fargo Bank N.A. plans to use the computer for fast-changing new applications and for end-user computing.

According to Michael G. Rowloff, vice-president and district manager of the technical services district at Wells Fargo, the data base machine has proven useful for prototyping, due largely to its self-normalizing relational structure and its use of Tequel, a query language similar to IBM's Structured Query Language.

"Once data is loaded into the relational model and you define relationships, you never have to define them again," according to Rowloff. "And it's easy to modify using procedural code."

Tequel allows the user to ask for data in any order, he continued. The language applies the arithmetic and logical operators and then displays the results without further definition.

"It's so quick that you can afford to think before you implement," Rowloff commented. "If the result isn't what you want, you can just throw it out without losing a lot of time."

Rowloff also sees the possibility of using DBC/1012 to gain some valuable on-line information from sequential files. "You could put a large sequential data set out on the DBC, superimpose a set of definitions on top of that and begin to access it with new Tequel programs and gain information from it you couldn't gain in a batch environment," he said. "I could put field definitions into the dictionary and access it randomly, create new views or use any kind of criteria I created in the table definition."

Because Tequel is relatively easy to learn, Rowloff plans to present it to executive-level users in the near future. The presentation will contain a few canned screens of information, but will also allow the data base to be queried on the fly, he said. Ideally, he would like to have users writing simple Tequel queries by the end of the presentation.

"The banking industry is very information-oriented, but we tend to be secretive about what we do in MIS," he said. "Tools like Tequel can be learned very quickly."

NETS from page 1

Other problems encountered stemmed from overoptimistic assumptions about features provided. Sumner said GE was left to contend with issues like flow control, speed recognition and adjustment and certain terminal compatibility concerns.

While, all in all, he is happy with his network vendor, Sumner said it needs to improve the product's ability to handle synchronous communications and, in the near future, will need to address the handling of high-speed interactive graphics.

In contrast to GE's experience, Texas Instruments, Inc. has had to do little modification to its Xerox Corp. Ethernet local-area network, according to William Roberts, manager of communications network support. TI has interconnected three physical sites via remote bridges to make up a single Ethernet. That network supports between 300 and 400 users and supports upwards of 20 hosts.

Attached devices include eight to 10 types of equipment, including asynchronous terminals and TI personal computers.

The primary reason for installing the network was to provide access to multiple host resources from a single workstation, Roberts said. Even at today's rate of device attachment, Roberts doesn't foresee any capacity limitations or network degradation occurring for two or three years.

Part of the assurance that the capacity of that network won't be challenged comes from Roberts' assumption that TI's network won't have to support video applications.

Just the opposite requirement led the U.S. Air Force to install a Wang Laboratories, Inc. Wangnet broadband local network. Dan Gartner of the Air Force's Aerospace Guidance and Metrology Center in Ohio said that although the network is still in the implementation stage, some interesting things have come to light.

These discoveries primarily involve hidden costs. For example, Gartner said, a personal computer attached to a Wangnet needs a separate emulator board for each individual type of host with which it hopes to communicate.

Another cost consideration cited by Gartner was the high cost of the frequency-agile modems needed with Wangnet. He said that an $1,800 personal computer he can get through the Air Force requires a $1,200 modem to connect it to the network.

On the positive side, installation for the Wangnet cable in this, the first of three phases of network implementation, was accomplished below projected cost, Gartner said.

Budgets up this year, managers tell DPMA

But they want increased funds for software, employee incentives

By John Gallant
CW Staff

PARK RIDGE, Ill. — Data processing budgets are up this year, but DP managers would like to see more money allocated for software and employee incentives.

In a survey conducted in January by the Data Processing Management Association (DPMA), nearly 74% of the 300 DPMA members responding said their DP budgets are higher than in 1983. Austin Weber, editor of the DPMA newsletter "Compufax," which published the survey results in its March issue, noted that the members were not asked by how much their budgets had increased. But he added that DP expenditures now total almost 2.5% of the membership's corporate budgets. With respondents' DP budgets ranging from a high of $2.5 million to a low of $300,000, the average DP budget of the organization's membership now totals nearly $1.65 million.

According to the survey results, the increasing DP budgets appear to be riding a wave of top management support. Almost 90% of the DPMA members questioned said management was "supportive" of their budget requests, with most spending increases approved with little or no hesitation.

Personnel outlays account for the largest portion of the DPMA members' budgets — 44% — the survey found. An average of 26% of the DP budget is earmarked for large systems expenditures, both mainframes and minicomputers, and another 12% is targeted toward software spending.

Hardware and software maintenance accounts for 9% of the budget; end-user training takes only a 3% chunk of the total. Spending on microcomputers comprises the remaining 6% of the DP budget.

However, the survey showed that DPMA members are increasingly concerned about retaining qualified DP workers. Weber said a majority of the respondents urged upper level management to "provide more incentives for retaining personnel for longer periods of time." Such incentives, he said, would boost employee morale and reduce the turnover rate. "Overall, I think the most important finding of this survey is the need to cut down on employee turnover," Weber said. "Top management has got to help DP provide incentives to retain employees. That will help make DP more productive within the organization."

Among other personnel concerns, nearly 20% of the DPMA members said they would like to see an increased financial commitment to end-user training.

Another common complaint that DPMA members voiced through the survey, Weber said, is a shortage of funding for software for both large and small systems. Respondents urged top management to allocate more money for software systems — especially those geared toward data security and "productivity enhancement." The DP professionals surveyed said "management must realize that software depreciates with time and is often in need of maintenance," Weber said.

Not surprisingly, 20% of the information systems professionals responding to the survey said that top management "would be wise" to increase the DP budget to 3% to 5% of the total corporate budget. The respondents added that management should also "try harder to understand the unique problems" DP managers face.

"The point of the survey is to give top management an idea of how DP/MIS feels," Weber said. "I think it shows clearly that there is an inherent need for top management to understand how and why DP managers submit their budgets. There is also a need to allocate more of the total budget for the corporate information resource."

More information about the survey results can be obtained by contacting "Compufax," DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

CORRECTIONS

"Vendor pulls application generator out of beta test" [CW, March 12] incorrectly stated that Analysts International Corp. had suspended testing at its initial beta site in order to make modifications to its Corvet application generator. While the company has suspended customer shipments in order to make the modifications, beta site testing is continuing.

The March 12 issue of *Computerworld* should have listed American Data Consultants' address as 112 E. 32nd St., Joplin, Mo. 64801.



Machine
MVS
USER

Machine
OS/V
USER

New version of Netway among show debuts

CW AT INTERFACE '84

By John Blx
CW Staff

LAS VEGAS — Although lacking blockbuster announcements, the Interface '84 communications conference held here last week in the city of glitter featured a number of product introductions from several vendors.

Tri-Data Corp. announced a new version of its Netway product line, components of which it had previously provided only on an OEM basis to other manufacturers.

The Netway 274 Multi-Dissimilar Host Cluster Controller can connect a wide variety of otherwise incompatible workstations and peripherals to multiple and dissimilar hosts, Tri-Data said. Each 274 controller has 16 ports which can be configured to support hosts or terminals, both of which can be supported on a point-to-point or multidrop basis.

The Netway supports IBM 3270 Binary Synchronous Communications and Systems Network Architecture/Synchronous Data Link Control, Burroughs Corp. Poll/Select and asynchronous start/stop protocols.

A typical Netway 274 configuration with eight ports costs $12,510. Deliveries are scheduled for April.

Tridata is based at 2674 N. First St., San Jose, Calif. 95134.

AT&T Information Systems used the Interface show to bring out Level IV of its Dataphone II family of network diagnostics and management control systems. The engine of the new product is actually a stand-alone applications processor, the add-on module used with AT&T's Dimension System 85 private branch exchange.

This device has eight control channels and is said to be able to store up to 3,000 modem/device profiles and records on up to 20,000 faults. By comparison, Level III offered only one control channel and could store profiles on 400 devices and record only 400 fault alterts.

Level IV is fully compatible and integrable with existing Dataphone II products, the company reported. It ranges in price from $96,000 to $125,000, depending on peripherals. Lease costs range from $4,600/mo to $10,000/mo.

AT&T Information Systems is based at 100 Southgate Pkwy., Morristown, N.J. 07960.

Codex Corp. introduced a number of products, the most significant of which was the new 2600 series of modems, built on a bus architecture that is managed by a Motorola, Inc. 68000 microprocessor.

When coupled with a signaling processor based on a custom very large-scale integration chip set and the first commercial implementation of a new modulation technique called Treills Coding, the top-of-the-line 2660 can achieve data rates up to 16.8K bit/sec in point-to-point applications.

The 2600 series also includes the 2640 and the 2620, which operate at 9,600 and 4,800 bit/sec, respectively.

One of the 2600 series' features is the Adaptive Rate System, whereby the modem will step down to a slower speed if the line it is using begins to degrade, then back up to the higher speed when the condition has passed.

The 2660 costs $13,000, the 2640 costs $7,200 and the 2620 costs $4,175. One- to five-year leases are available. The 2620 is the only product not presently available.

Codex is located at 20 Cabot Blvd., Mansfield, Mass. 02048.

Gateway to 3270

Infotron Systems Corp. went to Interface '84 to announce the Virtual Terminal System (VTS), said to provide a gateway to IBM 3270 applications for Infotron's multiplexer, data switches and network concentrators.

The terminal emulation system enables Ascii and other asynchronous terminals (including personal computers) to work in a 3270 synchronous network, Infotron said. Multiple applications or multiple hosts can be accessed from a single network connection. Devices and hosts are supported at speeds up to 19.2K bit/sec.

Two models are available. The $5,800 VTS 351 handles up to six Ascii devices, and the $7,600 VTS 352 supports up to 12 devices. Both are available stand-alone or in rack-mounted configurations.

Infotron also announced two terminals that are said to be designed specifically for use with the VTS. The 700 and 701 have an IBM 3278-like keyboard, menu-driven configuration capability, an RS-232C printer port with automatic speed detection and display and diagnostic attributes similar to the IBM 3277, 3278 and 3279 display stations, Infotron said.

The 700, which costs $1,100, has a fixed-display format, whereas the 701, priced at $1,750, offers eight user-selectable formats. Shipments are slated to begin in May.

Infotron is located in the Cherry Hill Industrial Center, Cherry Hill, N.J. 08034.

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White House seen proposing telecommunications policy

By Phil Hirsch
CW Washington Bureau

LAS VEGAS — As soon as the telecommunications industry's warring factions reach a consensus, the White House will propose a new national telecommunications policy and work for its adoption.

This was the view of Alfred W. Van Sinderen, president of Southern New England Telephone Co. (Snet), who delivered the keynote address here last week at the Interface '84 communications conference.

The prediction that the White House will assume an active role in developing national telecommunications policy, Van Sinderen told a press conference following his keynote address, is based on recent talks with officials at the National Telecommunications and Information Administration, the president's chief telecommunications adviser.

Other predictions

Van Sinderen also said at the press conference that:

■ There may be a need for increased government support of telecommunications research because of AT&T's divestiture. The company faces increased competition in the interstate services market, and the divested Bell operating companies are now buying terminal and transmission equipment from other suppliers. By 1986, Van Sinderen said, AT&T's earnings may be reduced to the point where it has to trim the Bell Labs budget.

■ Rivalry between the newly created regional Bell operating companies and AT&T is one reason for the decline of service since divestiture. Another is the difficulty of providing service when personnel and facilities are being shifted and new organizational charts and resource management systems have to be created.

But Van Sinderen expects much less confusion six months from now. When his company receives a service order that requires a sign-off by AT&T, Snet does the work immediately to keep the customer's goodwill, "even though we know it will be six months before AT&T pays us."

■ Digital Termination Services, Inc., a company in which Snet has a 40% interest, plans to begin premarketing its microwave-based digital termination service in Washington, D.C., and one other city — most likely to be Atlanta or Chicago — this summer.

Private network service promised by year-end

By Phil Hirsch
CW Washington Bureau

LAS VEGAS — A new private network service will be tariffed by AT&T Communications before the end of this year, Service Development Director Richard Snowden said here last week.

With the network, users who transmit the appropriate instruction codes on-line to a network control point will be able to reconfigure their networks dynamically at any time, Snowden claimed.

Snowden disclosed plans for the new offering in a talk given at last week's Interface '84 communications conference.

Accunet T1.5 enhancement

The new service, he said, will be an enhancement of AT&T Communications' already tariffed Accunet T1.5 service, composed of leased point-to-point transmission links operating at 1.5M bit/sec. Typically, each link is multiplexed into multiple voice and/or data subchannels.

Besides changing the traffic mix to accommodate random fluctuations in message and session volume, the enhancement also will permit the network to be geographically reconfigured. As traffic peaks and valleys occur at various points, subchannels can be reconnected to provide capacity where it is needed.

"Initially, we will offer reconfigurability only with a totally private network of T1.5 subchannels," Snowden said. Later, however, users will be able to interface these subchannels to public voice and data networks; by transmitting the appropriate codes to the Accunet network control point through a teletypewriter, users will be able to connect an individual subchannel to different networks at different times as required by changes in their traffic patterns, or to exploit time-of-day or other discounts, he said.

By providing a dynamically reconfigurable transmission path for voice, data and image traffic, the service should make wideband more economically feasible for more users. The economics of wideband are likely to become more appealing after the new cost-based tariffs mandated by the Federal Communications Commission become effective. Those tariffs will increase rates considerably for voice-grade private lines.

Snowden said the Accunet T1.5 service exemplifies a major objective of AT&T Communications during the 1980s: To provide customers with the capability to manage their transmission facilities directly. He indicated there will be further offerings embodying this same idea.

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McAuto tells how it's controlling micros

CW AT INTERFACE '84

By Phil Hirsch
CW Washington Bureau

LAS VEGAS — At least one large company has managed to control the internal use of personal computers throughout its organization, attendees at last week's Interface '84 conference here were told.

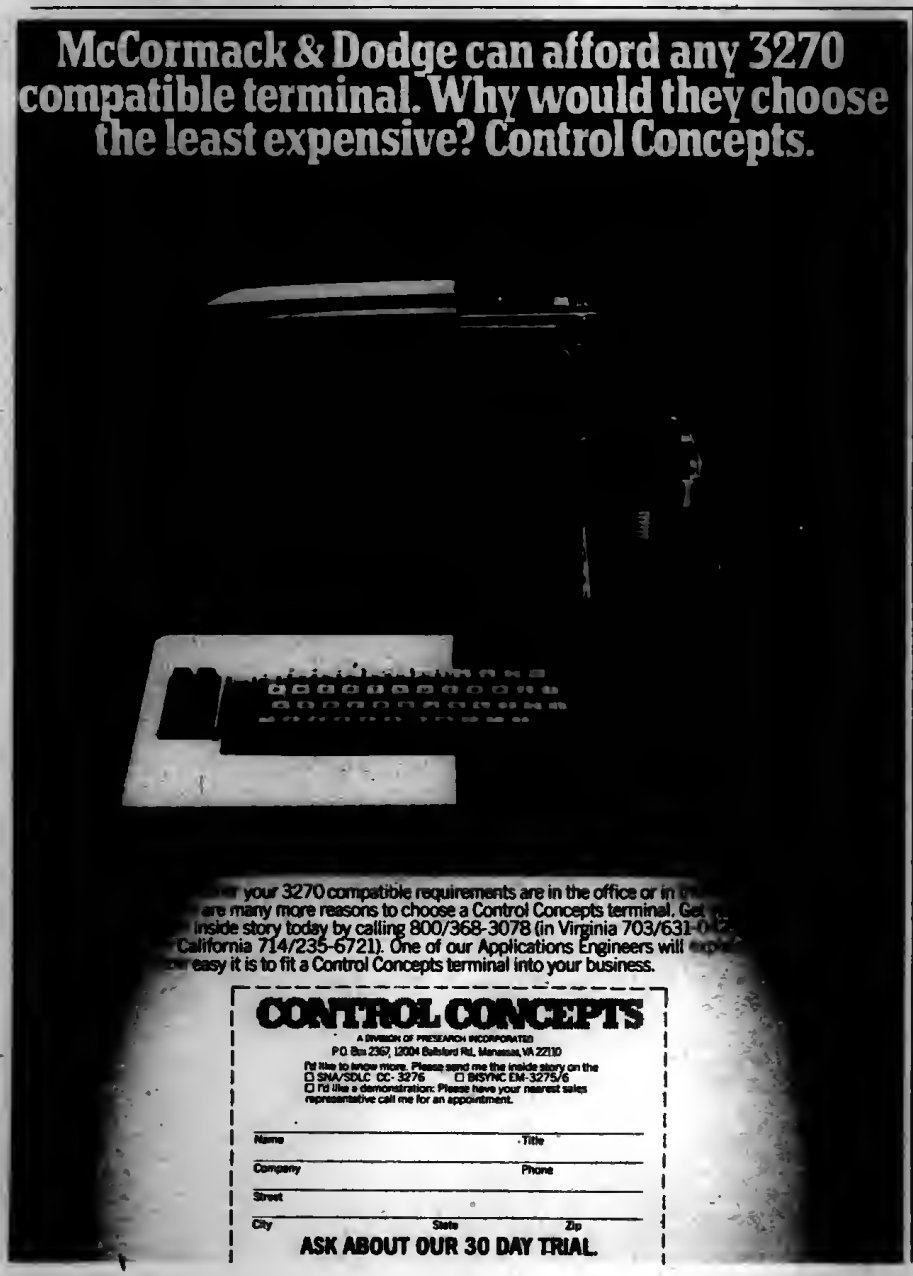
R.D. Greco, director of information resources management for McDonnell Douglas Automation Co. (McAuto), said his company began looking at personal computing about 18 months ago. At that time, McAuto's information system, based on large, centralized IBM mainframes, began breaking down. Partly because of corporate acquisitions, demands on the system changed qualitatively and increased quantitatively, Greco said. As a result, it became increasingly difficult for users to get jobs done on time.

The first step toward a solution came when the company decided to decentralize its computer activities. Personal computers immediately became a very attractive option, Greco said, but problems quickly developed. Swarms of microcomputer vendors suddenly appeared; biases for and against particular personal computers surfaced within the company, and there was growing concern that McAuto would end up with chaos — multiple personal computers and programs that would not be able to communicate with each other.

The problems were solved, he said, by:

- Setting up a technology review group to analyze and then specify the personal computer hardware and software that would be funded by the company.
- Establishing a user support center within each component of the corporation.
- Providing classes for familiarizing users with all the specified products. Heavy use is made of tutorial software developed by outside vendors.

Implementing these measures "brought immediate stabilization to our previously chaotic" computer environment, Greco said. McAuto has installed 350 personal computers so far and plans to add 400 more this year. Half of the latter will be assigned to programmers. Micros offer "significant productivity improvement potential," Greco said.



Session focuses on gateways

By John Dix
CW Staff

LAS VEGAS — IBM will make its token ring local-area network available when it can offer gateway support for it through its Systems Network Architecture (SNA), probably in the fourth quarter of this year.

That conclusion was drawn by Dan Zatyko, president of Zatyko Associates of Tustin, Calif., at a session on intelligent gateways held here at the Interface '84 conference last week.

The capabilities made available with the introduction of the SNA Network Interconnection products this year are "the most significant announcement for SNA since 1978," Zatyko said. They will pave the way for autonomous networks, including local-area networks, within SNA as well as provide for SNA network interconnection, he added.

"We will no longer have one large corporate network trying to serve all needs," Zatyko said. "We'll have smaller interconnected networks."

Getting down to basics, session leader Francis X. Dzubeck defined a gateway as a hardware/software component that interconnects two heterogeneous networks; a bridge, in contrast, connects homogeneous networks. In function, gateways provide code and speed conversion, protocol interface compatibility, routing, error recovery and access capabilities, explained Dzubeck, who is president and chief executive officer of Communications Network Architects in Washington, D.C.

Other than those discussed by Zatyko, typical gateways are used between vendor-specific network architectures and one of the following: X.25, SNA, Ethernet and some vendor-specific architectures.

Gateways have classically been user-created software interfaces developed to optimize investment in existing but disparate networks, Dzubeck said. Like Zatyko, Dzubeck said that gateways can "extend a hierarchical network to include a peer-coupled subnetwork and provide peer-coupling for hierarchical networks such as SNA."

Some disadvantages to gateways, however, are that they are complex and degrade network performance to some degree, Dzubeck said.

WASHINGTON UPDATE
Jake Kirchner
CW Washington Bureau

NSF brass asks Congress for national tech agency

WASHINGTON, D.C. — The chairman of the National Science Foundation's (NSF) supercomputer advisory panel said he supports legislation to set up a national technological foundation, which he said could help universities gain access to advanced computing facilities.

Dr. Kenneth G. Wilson, a Nobel laureate physicist from Cornell University, said on March 14 that the $20 million in NSF's proposed 1985 budget for supercomputer research and development support does not address all the needs for academic access to large scientific computer systems.

The NSF "was designed to protect long-range scientific research from short-term political crosscurrents," according to Wilson, who believes "some alternative mechanism does have to be established which would provide a second source of instrumentation grants for universities, especially grants for computing equipment."

Wilson told the House Subcommittee on Economic Stabilization that the proposed Advanced Technology Foundation Act could fill that need.

One provision in the bill would create a foundation to help support cost-cutting applied research to stimulate commercialization of new technology. The foundation would support research centers and find other ways to speed widespread adoption of technological innovations.

This type of agency, Wilson told the subcommittee, could help spur the supercomputer industry "to serve the industrial scientific market more effectively, pursuing research problems — for example in software productivity — where industrial benefits are immediate."

Justice halts firms' sales of 'abusive tax shelters'

WASHINGTON, D.C. — The Justice Department has obtained an agreement halting the sale by two firms of what the government called "abusive tax shelters" involving computer hardware and software leases.

The consent judgment was filed in U.S. District Court in San Francisco, resolving a civil suit brought at the request of the Internal Revenue Service. The defendants were Computer Alternatives, Inc., its president Robert K. Ramers, of Larkspur, Calif.; and John M. Holdaway, of Sandy, Utah, president of Computmaster Financial Services.

The IRS had accused them of selling packages of computer leases worth between $24,960 and $50,328. One hundred and one of the systems were sold in 1982, causing U.S. Treasury losses exceeding $2.2 million, according to documents filed with the District Court.

Because the packages were greatly overvalued, they lacked "economic substance," according to the government, which said, as an example, an investor in the 50% tax bracket could buy a package for $6,995 and take $10,492 off his taxes in credits and deductions.

Under the terms of the settlement, the defendants, who did not admit guilt, agreed to stop selling the packages and notify the IRS of any future tax-advantaged computer lease activities. In addition, Ramers and Computer Alternatives paid a $50,000 penalty, and Holdaway paid a $20,000 penalty.

Despite repeated attempts, neither of the defendants could be reached for comment on the settlement.

CWA adds voice to plea for VDT work place laws

WASHINGTON, D.C. — The Communications Workers of America (CWA) has joined with other segments of organized labor that are asking Congress to pass legislation to ameliorate the working conditions of video display terminal (VDT) operators.

David LeGrande, CWA representative for occupational safety and health, told a House of Representatives' labor subcommittee March 14 that VDT worker complaints of visual, musculoskeletal and job stress problems are frequent and constitute "a dangerous side effect of high tech," warranting "scrutiny by lawmakers."

The Health and Safety Subcommittee has held three days of hearings, taking testimony from labor representatives calling for government action to ensure safe working conditions for VDT operators.

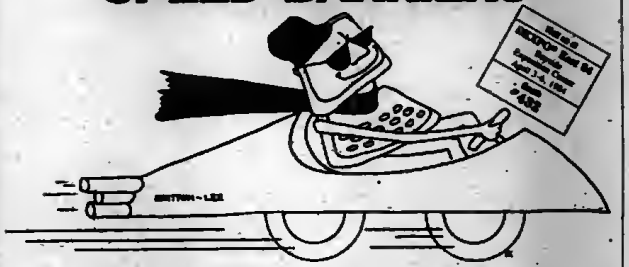
The panel will later hear from representatives of the scientific community and from terminal manufacturers.

LeGrande urged the subcommittee to encourage the National Institute for Occupational Safety and Health to begin comprehensive research projects on a number of possible VDT health hazards, including such areas as visual, job stress and reproductive problems.

He also said the Bureau of Radiological Health should set specific standards controlling the manufacture of VDTs.

Lastly, LeGrande suggested Congress adopt legislation "specific to VDT work environments." This legislation "should provide for the duration of work periods, visual testing, ergonomics, job stress research and protection from potential reproductive hazards and worker participation in the introduction and use" of VDTs.

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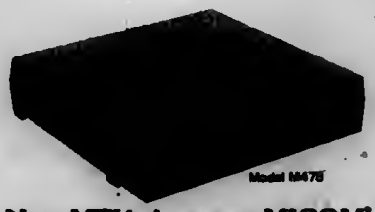
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Info center seen budding under vigilant MIS

Crwth survey summarizes trends, growth

CW AT CBT CONFERENCE

By Patricia Keefe
CW Staff

CHICAGO — The increase in the growth of information centers during the last three years has typically occurred under the watchful eye of the MIS department in an IBM environment, according to a recent study on information center growth.

"The Crwth Information Center Survey" was conducted by Crwth Computer Coursewares, vendor of interactive computer-based training. It was summarized at last week's Computer-Based Training Conference & Exposition here.

Among the study's findings:

■ The information center is most often organized within the MIS department, with more than half the center managers reporting to the MIS director or manager of systems and programming.

■ The user profile is broken down into business analysts who want decision-making aids (36%), clerical and administrative staff seeking basic information processing skills (25%) and supervisory personnel who need support services (15%).

■ There is no standard method for charge-back, although some respondents indicated that costs and charge-back become more of a concern as the number of users increases.

The study noted that approximately 1,400 information centers have been established since the introduction of the concept by IBM Canada in 1976. Among survey respondents, 37% launched their information centers less than a year ago. The overall number of centers is expected to double, rising to 2,100 installations by the end of this year.

This growth is not without its problems, according to the survey report. Advances in technology that are as new to experienced programmers as they are to novice end users are creating a threat to end-user support.

These technologies include fourth-generation languages, microcomputer software, networking of personal computers and mainframes, distributed data base administration and educational technology, all of which Crwth said has "landed inside the boundaries" of the information center.

The survey also found that although 88% of the respondents have less than 50 personal computers, 40% expect to add 10 to 50 more this year, typically the IBM Personal Computer. Even so, it is estimated that two-thirds of end-user applications involve large departmental or multidepartmental data bases. This suggests that end users' needs may quickly surpass the capabilities of personal computers, Crwth observed.

Other obstacles to information center implementation include a critical shortage of DP trainers, lack of end-user awareness, DP and management resistance and system resource shortages. Crwth suggested the development of an internal marketing program to communicate the benefits of the information center.

Such a program takes on added importance given Crwth's belief that a company's success will ultimately depend upon its ability to train large numbers of end users to use information resources advantageously: "By supporting end-user computing, the information center can play an important role in providing faster, better access to corporate information," the study added.

CBT combating trainer deficit: survey

By Patricia Keefe
CW Staff

CHICAGO — A "critical shortage" of DP trainers is "seriously jeopardizing" efforts to train end users to be self-sufficient in computer skills. However, many information centers are successfully overcoming this obstacle with computer-based training (CBT), a recent study on the growth of information centers found.

Conducted by Crwth Computer Coursewares, a vendor of interactive computer-based training, the study examined some of the obstacles to information center implementation. More than 150 corporations were interviewed in the survey, whose results were summarized by Crwth President Marsha Seidman at last week's Computer-Based Training Conference & Exposition here.

The survey found that the foremost obstacle to information center implementation is a shortage of DP trainers and educational/product consultants. Only 12% of the survey respondents claimed to have sufficient staff.

Moreover, very few of the information centers surveyed have full-time DP trainers or consultants. Adding to these woes are the predictions of a survey by California-based Input, a market research firm, which expects a 400% growth in the number of end users by 1985, outstripping an expected doubling of information center staff during the same period, Crwth said.

"In view of this critical shortage of DP [training staff], this problem may only be alleviated through the integration of state-of-the-art education technology in the information center," the study said. Otherwise, it warned, the information center may grind to a halt if effective alternatives are not found.

Supporting Crwth's conclusions are those information centers (56%) which have already implemented some form of CBT. In fact, the survey found that more end users are trained annually with CBT than without, regardless of staff size.

Among the information centers that do not provide CBT, 38% said they train fewer than 100 users annually, while 30% train more than 200 users a year. Conversely, among centers that do provide CBT, 22% train less than 100 users, and 45% train more than 200 users per year.

Most of the information centers using CBT, according to the survey, said it provided better training availability (97%), decreased scheduling problems (88%), offered more individualized training (94%) and improved their ability to reach remote users (81%).

The "Crwth Information Center Survey" is available free of charge to DP trainers and information center management from Crwth Coursewares, Suite 200, 613 Wilshire Blvd., Santa Monica, Calif. 90401.

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CBT developers urged to focus on people needs

By Patricia Keefe
CW Staff

CHICAGO — Developers of computer-based training (CBT) products need to focus more on the diverse needs of people, developing adaptable systems to meet those needs.

"We have to learn how to make the instructional process conform to each learning personality instead of the other way around," Serge Beauregard, chief technologist and executive vice-president at Deltak, Inc., told attendees at the Computer-Based Training Conference & Exposition here last week.

Ideally, a balance must be struck between the student's and the system's control of the training. "We need an instructional medium that knows when to let go and when the student is out of control," he said, touching upon an issue that surfaced repeatedly during the conference.

See CBT page 15

CBT strategy shown to reduce training costs

CW AT CBT CONFERENCE

By Patricia Keefe
CW Staff

CHICAGO — Christopher L. Howey is a person who once practiced what he now preaches: the use of a carefully orchestrated computer-based training (CBT) strategy to reduce training costs.

Speaking before a cost-conscious flock at the Computer-Based Training Conference & Exposition here last week, Howey related his experiences in developing a cost-effective training strategy for Arthur Andersen & Co., where he is a CBT specialist.

It is not enough to know that CBT will cut costs, Howey said; proof is usually needed to convince management. Toward that end, Howey developed a methodology for examining CBT from a cost perspective.

"You want to be able to leverage capital and labor costs," he stated, and break those costs down into the four models of training delivery systems:

- Low-technology/low-labor, typically text-based self-instruction.
- High-technology/low-labor, typically computer-aided instruction alone, where few people, but a lot of equipment, are required to deliver the service.
- Low-technology/high-labor; this is an instructor-led classroom.
- High-technology/high-labor, typically the use of expert systems as job aids in work environments requiring a large labor force.

To determine which model best fits an organization's needs, Howey suggested asking how many people will be serviced, whether the course content will be stagnant over a long period and how important are other issues such as standardization of technology or instruction. Also to be considered are the pros and cons of the costs of various training alternatives, such as centralized, labor-intensive options (traditional training methods or sending people to a centralized training site); decentralized, capital-intensive options (computer-intensive training); and decentralized, labor-intensive methods (sending staff to training sessions outside the company).



CW Photo by P. Keefe
Howey

Another issue concerns the cost phases of actually developing a training program. Ticking off the three phases — design, development and delivery/maintenance — Howey urged his listeners to look out for recurrent expenditures.

Cost estimates should also be formulated, he suggested, for the participant-to-instructor ratio, the faculty ratio (how many faculty members of what type are required to teach) and the different classifications of participants, who create different billable rates. Other fixed costs include transportation, technology and production, according to Howey.

One area of cost that may be overlooked is what Howey called "lost-opportunity costs."

"The single thing that is able to justify CBT is lost-opportunity recovery, in terms of salary and travel time," he said. A shorter, more precise training period will provide a shorter payback in terms of increased productivity, he explained.

CBT from page 14

Many speakers and attendees here lamented the inflexibility of many systems that will not allow users to back up or skip over nongermane material.

Equally important is the training program's perception of who is on the other side of the screen, Beauregard said. "You have to understand that there are some limitations to a system that doesn't know whether the student is awake or asleep," he added.

Noting that each individual has a different learning profile, Beauregard predicted the development of CBT systems that take into account the aptitude, cognitive style (graphic vs. verbal orientation), motivation and personal biography of each student. To develop intelligent systems of this type, it will be necessary to "raise the IQ level" of computers, he said.

Before that can happen, however, changes will have to occur in some areas of technology, he said.

Those changes include an increase in computer "horsepower," from desktops to IBM 4300 series systems, in order to design, conceive and create more responsive learning environments; a dramatic increase in available memory; the development of a learner's "workbench" environment; and an authority system that can weave together all the parts.

These changes will open the door to the development of more expert knowledge-based systems based on artificial intelligence, he said.

Expert systems differ from such standard systems as payroll in that they can "learn" from experience, offering a diversity of information that was not in the original program; provide the combined expertise of many professionals; and use intuition in making judgements.

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Consultant warns of inherent risks of CBT

Trainers need clear grasp of forces involved in CBT implementation

CW AT CBT CONFERENCE

By Patricia Keefe
CW Staff

CHICAGO — Advocating change in any corporate operation can be pretty risky, particularly when new concepts are involved, and "every time you do something with computer-based training [CBT], you will be doing it for the first time," a management consultant warned here last week.

The introduction of any new program boils down to five phases: initial enthusiasm, disaster, search for the guilty, punishment of the innocent and praise and reward of nonparticipants, quipped consultant Gloria J. Gery, president of Gery Associates and vice-president of The Courseware Developers, Inc.

The road to successful implementation of CBT is paved not with good intentions, but rather with a clear grasp of the forces involved — pro and con — she advised participants at the Computer-Based Training Conference & Exposition. "All too often, people are pushed to get CBT and then punished because mistakes are made," she said.

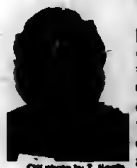
Points to consider

Gery's presentation addressed a number of points that training managers should consider when selecting and implementing CBT systems. Successful implementation of CBT, she said, starts with gaining sponsorship within the organization. Sponsorship translates as financial support and is vital to the success of any program, yet often is taken for granted, she said.

To gain corporate support, managers need to motivate change. This is accomplished by assessing the current scope of training, figuring out what the options are and creating a vision of the desired state, she continued.

It is important to be realistic here, because many CBT vendors and consultants have succeeded in creating ridiculous expectations in users, Gery contended, and training managers risk loss of credibility when these hopes are dashed.

When selecting courseware, planners should realize that training is part of the package. "A well-designed [CBT] system doesn't need a training course," Gery claimed. Some of the risk in software selection and development can be alleviated if planners first educate themselves about the process involved.



CW photo by T. Keefe
Gery

CBT advocates want to be in a position to manage change systematically, creating a favorable imbalance between the driving forces for and against CBT, Gery said. Although there are many good reasons to use CBT, the pitfalls are also many, she added.

The foremost pitfall, she said, is the impact of technological advances. Although new technologies are expected to make the transition of CBT from conceptualized ideas to a viable reality, the speed with which these changes are occurring has created a measure of instability. Courseware companies are springing up all over, and standardization is still unsettled, she added.

There are many myths about CBT development that managers would do well to avoid, Gery advised. Among those myths, she noted, is the easy program change.

She warned that the more integrated the system, the more difficult it is to make the changes. Nor is distributing those changes digitally likely to be any less a nightmare than doing so manually, Gery maintained. Moreover, getting programming help to make those changes can be difficult.

"Sell MIS on the productivity gains resulting from your program; otherwise you could be bumped off the system or end up with unused courseware," Gery concluded.

DPMA group elects chief

PARK RIDGE, Ill. — Bruce E. Spiro has been elected 1984 president of the Data Processing Management Association (DPMA) Education Foundation. Formerly vice-president of the foundation, Spiro is chief of the Automatic Data Processing Equipment (ADPE) systems management office at the U.S. Defense Communications Operations Center.

Spiro joined the U.S. Defense Communications Agency in 1965 as head of the ADPE systems for communications control. The Defense Communications Agency provides development, engineering and management for the Defense Department's long-haul communications.

Elected to the foundation's board of regents were Dr. Joseph G. Deken of the Department of Computer Science at the University of Texas in Austin; M. H. Schwartz, general manager of Software Quality Service, Bethesda, Md., and author of *The Electronic Cottage*; and H. Ray Souder of Northern Kentucky University's Department of Information Systems.

IEEE to offer videoconference

PISCATAWAY, N.J. — "Personal Computer Software — An Aid to Improved Professional Productivity" is the subject of a one-day videoconference that will be given via satellite to selected universities, companies and other locations throughout the U.S. on June 12. It will be broadcast via an interactive one-way video, two-way audio network by the Institute of Electrical and Electronic Engineers (IEEE).

The course will provide an overview of software tools currently available for personal computers to improve professional productivity. Topics to be covered include the role of an operating system, modern programming and design languages, data base systems in the engineering process, project management tools, graphics and electronic mail.

Emphasis of the course will be on the capabilities of applications software available for professional use rather than on specific technical applications, a spokesman said. Telephone hookups will allow participants to interact with the lecturers.

Further information on the videoconference is available from the IEEE Continuing Education Department, located at IEEE Service Center, 445 Hoes Lane, Piscataway, N.J. 08854.

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Sperry DP study programs debut

PRINCETON, N.J. — Sperry Corp. Computer Systems Education has published a series of computer literacy self-study training programs for people interested in learning about the latest technologies.

Programs in the Sperry Computer Literacy series include "Introduction to Computers and Data Processing," $9.95; "Programming Theory and Design," $7.95; and "Number Systems," $4.95. Three other programs about Fortran, Pascal and Cobol languages are priced at $16.95 each. A program about the RPG-II language costs $19.95.

More information about the series is available from Sperry Computer Systems Education, P.O. Box 2191, Princeton, N.J. 08540.

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20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail Trade
50 Business Service (except DP)
60 Government—State/Federal/Local
65 Public Utility/Communication Systems/Transportation
70 Mining/Construction/Petroleum/Refining
75 Other User _____
Vendors
80 Manufacturer of Computers, Computer-related Systems or Peripherals
85 Computer Service Bureau/Software/Planning/Consulting
90 Computer/Peripheral Dealer/Distributor/Retailer
95 Other Vendor _____

2. OCCUPATION/FUNCTION (Circle One)
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Financial Officer
21 Director/Manager/Supervisor DP/MIS Services
22 Director/Manager of Operations/Planning/Administrative Services
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
35 OA/WP Director/Manager/Supervisor
38 Data Comm Network/Systems Mgmt
41 Engr/Scientific/R&D/Tech Mgmt
51 Mfg Sales Reps/Sales/Marketing Mgmt
60 Consulting Mgmt
70 Medical/Legal/Accounting Mgmt
80 Educator/Journalist/Librarian/Student
90 Other _____

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as user, vendor or consultant
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

CW-138

NEWS

Forum explores computing in campaigns

By James Connolly
CW Staff

WASHINGTON, D.C. — Data from drivers' licenses and magazine subscription lists, micro-to-mainframe links and laser printers let political candidates mold their campaigns and reach voters, according to speakers at a recent forum here.


Tobe

Computers in campaigns mean the ability to identify potential supporters from the 250,000 names in a congressional district, mass-mail personalized letters to those supporters and manage the business side of a campaign, said the speakers at the Annenberg Schools of Communications' Washington Program on Communications and Technologies.

"Almost all campaigns are aware that computers are affecting the campaign industry and realize that they are going to have to use them or see them used against them," said Frank Tobe, president of Below, Tobe and Associates, a Los Angeles firm that specializes in campaign software and campaign data services. Key uses for computers in elections are the identification of voters and support in reaching those voters "to change an opinion or to help the voter form an opinion."

Tobe told campaign workers, journalists and political scientists how technology can help a candidate. Using an IBM 3031-AP mainframe with 8M bytes of main memory, 4G bytes of disk memory, various tape drives and four printers — including a Xerox Corp. 9700 laser printer — Tobe's firm maintains data on 16.6 million voters in 38 states.

He and other consultants, including William P. McMillen of Connecticut and Edward Schneider of Detroit, explained how cross-matching the information in the public domain, such as voter registration and drivers' licenses, can be merged with commercially available lists, such as telephone directories and magazine subscription lists, to develop voter profiles by district, neighborhood and individual.

McMillen told the 75 forum attendees that 1980 independent presidential candidate John Anderson determined that some of his best supporters fit a particular mold. Using overlays, Anderson compiled lists of voters who were over 40 years old, drove foreign cars, read *The New Republic*, bought "high ticket merchandise" and lived in suburbia.

Schneider emphasized that such data bases must be built from various sources and that no single source provides a clear enough profile for candidates to make decisions.

Tobe said that in the 1984 election year, his company will produce 100 million pieces of mail, targeting not only voters, but also officeholders facing decisions on assorted issues. He told how laser printers can produce thousands of premarked absentee ballots with party slates checked off for voters in states that allow such balloting.

Such printers also have produced up to 2,160 mass-mailed constituent letters for each congressman, with each letter bearing a different voter's name, personalized letterhead and personalized type font. To distinguish the letters from other mass mailings, Tobe's firm asks voters to mail the letters in their own envelopes.

'Get out the vote'

The printers can also produce "get out the vote" messages, with the names of hard-to-elect candidates highlighted in their least secure voter neighborhoods.

Micro-to-mainframe links and communications among microcomputers also are becoming crucial for candidates, Tobe said. He reported that the Liberal Party in Canada is expected to use 90 or more IBM Personal Computers and compatible micros to allow campaigns of parliamentary candidates in different districts to share data in the upcoming elections there.

Tobe observed that today's voters are more "individualized" than their predecessors, and that campaigns must appeal to that individualism rather than relying on party loyalty. "If we know a person is a senior citizen, we can address that in the body of a letter. It may seem to be fleeting, but it isn't. We want to make that person pay just a little bit more attention to the message and hope [he] will remember the candidate's name favorably — or at least not unfavorably — and look for other things that the candidate has to say," Tobe said.

In some cases, he noted, candidates can include in data bases such details as whether a woman uses "Miss" or "Ms.," whether the person has ever met the candidate and the voter's likely ethnic background, based upon a dictionary of surnames.

When questioned by his audience about the ethics of directing a message to a single ethnic, economic or neighborhood group, Tobe emphasized that the concept of voter targeting is designed to inform voters of a candidate's stand on any of the several issues that concern the voter. The practice would be unethical, he said, only if the candidate sent "contradictory" messages to different voters.

According to Tobe, the value of computer-generated direct mail is particularly high in metropolitan areas such as Los Angeles, where it

See MAIL page 18

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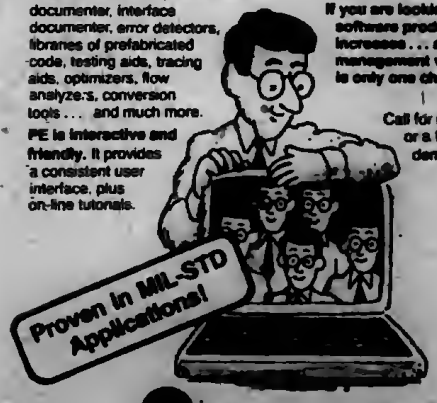
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Variety of sources seen critical to targeting voters

By James Connolly
CW Staff

WASHINGTON, D.C. — Drawing information from a variety of sources is the key to developing useful campaign data bases, a consultant told the Annenberg Schools of Communications' Washington Program on Communications Technologies and Politics here recently.

A computerized data base designed to target voters — to show a candidate which voters are friendly, or persuadable, and how to reach them — should utilize a combination of five sources, none of which can stand alone reliably, advised Edward J. Schneider, vice-president of Market Opinion Research of Detroit. The five sources are party organizations, previous election returns, political polls, census reports and lists such as telephone directories, magazine subscription lists and real estate tax rolls.

"What you need to do is to combine them so that the strengths of one lead into another," Schneider said. For example, party organizations and election returns might identify which voters are likely to vote and which voters need services such as rides to the polls. Meanwhile, census data can tell the candidate about a neighborhood's economic or educational makeup and give information about its home ownership pattern.

However, none of those sources tell the candidate what the voter is thinking, Schneider stressed.

'Clusters' advised

Schneider, whose company has done political work for individual candidates and for causes, advised the use of "clusters" to organize telephone or door-to-door surveys that can show what types of voters favor his firm's clients.

Those clusters can be built with the data drawn from the five key sources, Schneider said. A candidate might include in one cluster wealthy, well-educated suburban residents and in another cluster poor, uneducated urban residents.

He told how surveys will indicate, on percentage bases, which clusters favor the candidate, which are opposed and which rest in the middle, where they can be persuaded by either side in the campaign.

The data base, maintained on mainframes operated by companies such as his for major campaigns and used on microcomputers on the local level, can then be used again, he reported, to organize voter registration drives, fund raising, volunteer recruiting and "get out the vote" campaigns.

Those efforts are aided by the presence in the data bases of telephone numbers, ages, occupations and other information, Schneider noted.



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Hammer to talk at Federal Expo

WASHINGTON, D.C. — The former director of computer sciences for Sperry Corp., Dr. Carl Hammer, will deliver the keynote address at the 10th Federal DP Expo and Conference April 17-19 at the Washington Convention Center here. The topic of his address will be "Here Come the Micros: The Federal Future."

Hammer, president of Research Consulting Services in Washington, also served as manager of scientific computer applications for RCA Corp. He is a fellow of the American Association for the Advancement of Science. In addition to his address, he will present the first annual Hammer Award for the best conference paper.

Federal DP Expo will feature a 47-session conference highlighting the integration of desktop computers into the federal government's mainframe-based environment.

Registration for the conference for government employees is $95 for the full program or $40 for one day. Registration for all others is $125 for the full conference and $55 for one day. Government employees may attend the exhibits for free; all others must pay $10.

A discount registration fee for groups of five or more is also offered. More information about the conference can be obtained from The Interface Group, 300 First Ave., Needham, Mass. 02194.

MAIL from page 17

may be the only contact a candidate has with most voters. That may occur because a metropolitan area may have 20 or more congressional seats and dozens of candidates vying for news media exposure.

Tobe said that managing a campaign by computer has become more crucial, since the number of campaign workers has dropped, while the cost of campaigns has increased. Such management can involve organizing volunteers according to what tasks they can do and when, candidate scheduling, financial accounting, budgeting, word processing and operating telephone banks.

GOP seen years ahead of Democrats in computer use

By James Connolly
CW Staff

WASHINGTON, D.C. — The Republican Party, with a shortage of registered voters, is "10 years ahead" of the Democratic Party in building computerized national data bases for election campaigns.

However, Democrats at the grass roots level are more quickly recognizing the value of microcomputers than are their GOP opponents.

Those observations were offered by a Connecticut political and computer consultant who spoke here earlier this month at the Annenberg Schools of Communications' Washington Program on Communications Technology and Politics.

"The Republican Party is 10 years ahead of the Democratic Party as far as using computer technology, at least with major systems and major data bases," said William P. McMillen, chairman and founder of Word Communications Systems, Inc. of Ellington, Conn. Addressing 75 campaign workers, journalists and political scientists, McMillen added that Republicans have tended to centralize their party by using mainframes at national headquarters and sending relevant data to local candidates.

In contrast, Democrats have been less likely to centralize their data, according to McMillen. Instead, they have leaned toward smaller, microcomputer- and minicomputer-based systems for campaigns ranging from municipal elections to congressional races. McMillen reasoned that a growing number of Democratic campaign workers, particularly at the local level, have been young, college-educated and computer-literate.

The systems that McMillen referred to are used in 10% to 15% of all campaigns and in almost all races for congressional seats, he reported. "Overall, it is still a comparatively low percentage of campaigns that are using computers regularly. What is happening, however, is that you talk to a campaign and they say that Uncle Joe has a computer and that they are going to try some things on that. Of course, like everything else, as the prices keep going down, there are going to be a lot more computers out there."

McMillen, whose firm produces Politech I software for IBM Personal Computer XTs and the Candidate Information System for the IBM System/34 and 38, contracts with candidates to compile data bases in various elections.

The systems are intended to let the candidate target and reach potentially favorable voters, contributors, volunteers and news media; help the campaign save time and money by steering away from clearly hostile voters; and help manage the campaign as an organization. Management modules perform tasks such as strategy planning, volunteer organization, scheduling, budgeting, accounting and financial reporting.

McMillen said computers are used often for word processing and generating mail. Those uses include general clerical work and direct mail — often personalized for the voter. In connection with letter writing and speech writing, many campaigns are now using their computers to tie into commercial data bases such as those offered by United Press International and The Associated Press to aid in research.

McMillen observed that campaigns haven't been at the forefront in developing or accepting computer technology. "Campaigns are still backwards. These programs that we're talking about aren't magic. They've been developed for business for 10 years. You also won't see campaigns innovating, because they're here today and gone tomorrow. What you will see are things being developed for business, and we will mimic them."

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Figure 1—*User notes long response time for July 5, and enters "D" to generate degradation display in figure 2, at the arrow.*



Figure 2—*User observes that Private Page-In Wait is a problem and enters "R" to generate page dataset activity display in figure 3, at the arrow.*



Figure 3—*For detailed analysis of the paging resource, EPILOG/MVS shows statistics on both the page datasets and the DASD devices they reside on. This screen shows the cause of the problem: device contention causing very high busy rates on devices 150-152 which contain the local page datasets.*

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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

BRISBANE — An intelligent software editor that is said to prevent compilation errors is under development here at ICL, Inc. The first working system is due for delivery within the year, a spokesman said. The front-end editor will be based on ICL's Perq Professional workstation, which features graphics capabilities in addition to processing and storage power. It reportedly will perform compilation checking at the program input stage, carrying out syntax and semantic checks.

■

SYDNEY — The Net/Master network management and control software from Software Developments Pty. Ltd. will be distributed on a worldwide basis by Cincom Systems, Inc. Under the terms of a recent marketing agreement, the two companies will receive royalties on each package or component of Net/Master sold.

■

MELBOURNE — The Broken Hill Proprietary Co. Ltd. has ordered 21 SAS Software Pty. Ltd. data management packages for its Data General Corp. MV series minicomputers, even though some of the software products have not been fully converted to run on DG equipment. The order is valued at approximately $80,000.

FRANCE

PARIS — IBM dropped prices here and elsewhere on its Personal Computers. In Paris, prices fell 18% on the diskette version of the Personal Computer and 6% on the Personal Computer XT. In Stuttgart, West Germany, IBM GmbH slashed prices by about 20% on the basic Personal Computer and 10% on the XT; in Stockholm, IBM Sweden cut prices by 20% on the Personal Computer and 8% on the XT.

■

CANNES — A series of computers and office automation systems for the European market was unveiled here recently by Northern Telecom, Inc. Called the Vienna Family, the series reportedly combines a fully compatible range of hardware, international communications standards and widely used operating systems and languages. The system is based on Intel Corp. microprocessors and a twin Microsoft, Inc. MS-DOS/Xenix operating system.

JAPAN

TOKYO — Meiji Mutual Life Insurance Co. and Toshiba Corp. will jointly develop a large-scale document managing system incorporating Toshiba's optical disk file device, Tosfile 3200 and a local-area network.

■

TOKYO — The Ministry of Labor has released a report that lists a number of guidelines for the protection of VDT operators. The report is the result of a year-long study conducted by the Ministry and consists of three parts: working environments, working conditions and health management practices. One of the many recommendations made by the Ministry is that VDT operators should take a 10- to 15-minute break after every hour worked on the VDT.

■

TOKYO — Nippon Steel, which claims to be the world's largest steel manufacturer, will establish a computer network composed of several different types of systems scattered around Japan. The first step in the planned network was the formation of a data base for the Ironworks Operation Analyzing System at Nippon's Tokyo headquarters, which can reportedly be accessed by each of the company's ironworks sites.

NETHERLANDS

AMSTERDAM — Apparently IBM's antitrust days are still not over: The case between Big Blue and the European Economic Commission (EEC) is still making news here. Two of the four original complaints — concerning interface information and the bundling of a CPU with a certain amount of memory — still stand. The other two complaints — the bundling of system software with the CPU and the system installation productivity options — were dropped last year. Dutch Commissioner Frans Andriessen will render a decision on the case.

■

AMSTERDAM — The University of Nijmegen will be Holland's first user of Lisp Machine, Inc.'s Symbolics 3600 system. In all of Europe, there are only 25 Lisp systems installed, according to a spokesman.

SWEDEN

STOCKHOLM — The Swedish white-collar workers' union, known as TCO, will offer free computer education to its 46,000 members. The TCO initiative was taken in part to close the widening gap between older office workers and younger workers, who were taught computer science in school.

■

STOCKHOLM — The Swedish electronic firm Siemens-Elema has unveiled a pacemaker that can reportedly be programmed by radio signals from the outside without removing the surgically implanted device from the patient's body.

The firm is now in the process of developing a pacemaker that can reprogram itself by responding to a patient's own biological signals.

WEST GERMANY

MUNICH — While microcomputers are making their way into large companies in the U.S., this is not the case in West Germany. Analysts theorize that data processing managers in big companies firmly believe in the centralized DP concept and have a tendency to block the "micro invasion," fearing a loss of their status in the company.

■

MUNICH — Digital Equipment Corp. here has announced the MicroVAX I and the VAX-11/725 series, which is composed of six different models, for German offices. Pricing for a basic configuration starts at approximately $50,000.

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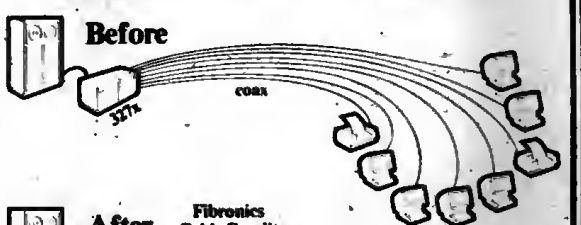
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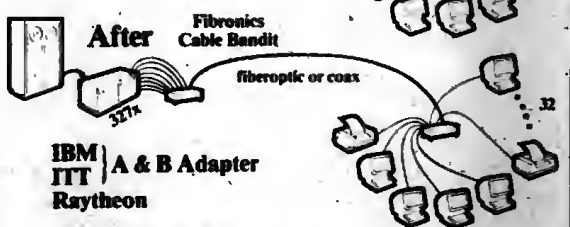
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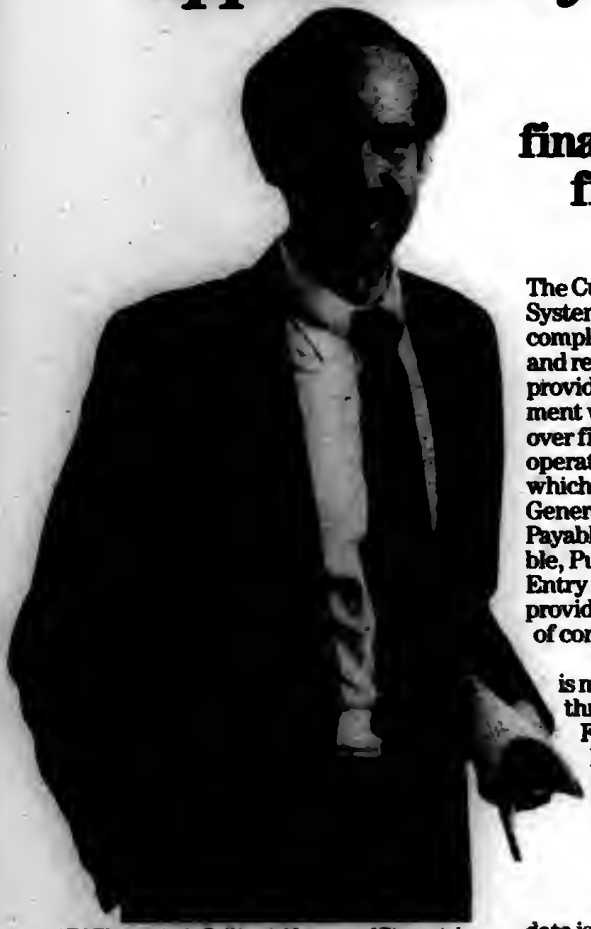
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Calgary, AB	May 23	Rye, NY	
Charlotte, NC	May 10	Oakland, CA	June 26
Chicago, IL	May 3	Omaha, NE	June 13
Cincinnati, OH	May 14	Orlando, FL	May 24
Cleveland, OH	May 24	Ottawa, ON	April 5
Columbus, OH	May 2	Ottawa, ON	May 8
Dallas, TX	May 15	Ottawa, ON	June 5
Denver, CO	June 13	Pittsburgh, PA	May 15
Des Moines, IA	May 16	Regina, SK	June 13
Detroit, MI	May 23	Rochester, NY	June 21
Fairfield, NJ	June 7	St. Louis, MO	June 19
Grand Rapids, MI	June 7	San Francisco, CA	May 24
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Hartford, CT	May 8	Seattle, WA	June 12
Houston, TX	May 10	Tampa, FL	June 5
Indianapolis, IN	May 8	Toronto, ON	April 3
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Minneapolis, MN	June 21	Washington, DC	June 28

Ed Blumstein is Cullinet's Manager of Financial Applications Software Development and has directed Cullinet's rapid entry into this field. He joined Cullinet in 1981 with experience in database and applications software. Ed holds a B.A. in Economics from Brown University and an M.B.A. in Finance from Boston University.

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CW-319

Fingerprint ID system quick to solve criminal cases

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — A computerized fingerprint identification system recently installed at this city's police department yielded surprising results just one week after going on-line this month.

The $2.6 million Automated Fingerprint Identification System (Afis), manufactured by NEC Corp., has already resulted in an arrest for a previously unsolved six-year-old murder case and the identification of 40 other criminal suspects.

Announcing the system at a press conference on March 2, San Francisco Police Chief Cornelius Murphy said, "This system represents the most dramatic investigative tool introduced in the history of this city's program to equip our law enforcement officials with the tools they need to apprehend criminals quickly and effectively."

Up until this time, only Japanese police had access to Afis. Soon, however, a similar system is to be installed for state police in Alaska, and more systems, elsewhere in the nation, are expected to follow.

Removes file searching

The system is intended to remove the labor- and time-intensive fingerprint file search process. It enables local police officials to check fingerprints taken at the scene of a crime with those of known criminals on file at a rate of 650 prints per second. A trained fingerprint specialist then verifies the match and subsequently provides expert testimony that is required in a court of law.

Last week, according to the San Francisco Police Department (SFPD), computer technicians and city workers completed the electronic transfer of some three million fingerprints, accumulated over 40 years, from city hard-copy files to the new system's data bank.

Consisting of a scanning device and a reader with three components — a controller, a scanner and a processor, the Afis system converts the scanned information into binary data, which is transferred to a graphics display device called a Fingerprint Input Monitor, where forensic experts are able to enhance the print image.

The scanning process takes place on a NEC mainframe, and the data files consist of twin drives capable of storing up to 1.27G bytes of information. Prints which match up with those already stored in the data base are called up on three on-line terminals.

One of the areas where Afis is expected to reap particularly favorable results is in searching the data bank for possible matches against partial or "latent" prints taken from the scene of a crime.

According to the SFPD, partial prints — some no larger than a dime — have historically been very difficult to process manually against full-fingerprint file copies.

In the past, police officials stated, a manual search could take months, as detectives attempted to match a fingerprint taken from the scene of a crime against one in the city's files, often without success. The new system, they claimed, can complete a thorough search for a match in less than an hour in almost all cases. And for the majority of cases, search time is an estimated five minutes, they maintained.

Using a microfiche retrieval system controlled by NEC's Advanced Personal Computer and extensive new algorithms, company officials claimed the prints can be graphed, plotted, clarified, enlarged and quickly scanned to match against fingerprints in the data bank files. A NEC Spinwriter printer is used to print out the results of the matched prints.

"In one week, we have

See AFIS page 28

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DP managers urged to police micro purchase, not use

By Paul Kunsmiewski
CW Staff

NEW YORK — DP managers should set a policy for purchasing microcomputers and then allow users to determine how the machines will be used.

Users, data processing managers and industry analysts delivered that message at a conference on "Microcomputers: High Performance/High Payoff," which was held here earlier this month by Micro Mainframe, Inc. of Cambridge, Mass., and Morris Decision Systems, Inc., based here.

"The data processing manager's function is to determine a policy, not implement a plan," said Peter Berg, chairman of Micro Mainframe. "There is an important distinction between a policy and a plan. A policy establishes the rules of the game: The company will work this way. It incorporates accountability and involves complex planning. It should not be done by a chief executive, but by the MIS manager."

A policy should limit brands of hardware and software so the company is not saddled with numerous incompatible systems. But each user should determine the benefits of a given package. "If a user has been using a Cobol generator and likes it, then he should be allowed to continue to use it," said Dr. G. M. Hughes, vice-president at Pfizer, Inc., a pharmaceutical company here.

Allowing this flexibility will require a change in DP managers' thinking. "Data processing managers must recognize and respect the reality of ambiguity in a decentralized policy," Berg said.

"That requires a new style of delegation. The data processing department should license hardware and software to the user. Once he has the license, he should be able to drive wherever he wants, within limits. It is the auditor's role, not the data processing manager's, to police the drivers," according to Berg.

Berg predicted significant changes in software. "[Lotus Development Corp.'s] Symphony is the last significant product of this generation of software," he said. "We are witnessing the end of the [Visicorp] Visicalc era. Shortly, software will be written for new hardware with 1M-byte random-access memory, bit mapping, data base management and downloading features."

While software will become more powerful in the next few years, Anthony P. Morris, president of Morris Decision, a microcomputer sales and consulting firm, thinks that the user interface will remain constant.

"Once a user becomes accustomed to working with a piece of software, it is very difficult for him to switch to another package, no matter how powerful it is," Morris claimed.

AFIS from page 25

done the equivalent of six months' work. We have so far identified 40 criminal suspects just from the fingerprints, when our usual total is 60 per year," commented inspector Ken Moses of the SFPD. Moses said the system was expected to help not only with crime detection, but also with crime prevention by leading to the capture of criminals such as burglars and rapists who are apt to commit a crime more than once.

"When fingerprints are involved as evidence, there is traditionally a conviction rate of 98%, since there is very little defense against a fingerprint," he added.

In addition to "scene-of-the-crime prints," under the new system anyone arrested and booked on a felony will automatically have his fingerprints entered into the data bank. Afis, in turn, will perform an automatic check to determine if the prints have been filed previously.



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NEWS

Bank executives warned of dangers of electronic fraud

By James Connolly
CW Staff

WASHINGTON, D.C. — "When dealing with computer security, you have to remember that computer-related crime is a people problem."

So said Anthony J. Adamsky Jr., chief of the Federal Bureau of Investigation's Financial Crimes Unit, who addressed the Bank Administration Institute Bank Security Conference and Exposition here earlier this month.

Along with John R. Simpson, director of the Secret Service, Adamsky warned bank security officials of the dangers of computer crime and outlined some steps the federal government is taking to solve and prevent such crimes.

Adamsky encouraged the bankers to "hire good people" in their computer and wire-transfer rooms and to maintain tight audit procedures. He also stressed establishing a good rapport with employees, which allows management to identify early signs of worker stress and financial problems that could lead an employee to steal. He told the bankers to set up disciplinary policies that will deter crime.

"Basically, it is the person who has authorization to work with the computer who is involved in computer crime," Adamsky said. It is the hacker mentality — the compulsion to access what they shouldn't — that leads some data processing personnel to access computers illegally. These personnel, he maintained, should be weeded out of the company.

Adamsky told the bankers that the next several years will witness lawyers hagging over several questions of computer law, such as a definition of trespassing as it applies to data bases and of stolen goods as applied to software.

Adamsky couldn't estimate the extent of computer-related bank crime, noting that the potential is "enormous" and adding that many bank losses aren't reported. But Simpson noted later that the number of electronic funds transfer (EFT) cases reported to the Secret Service has increased rapidly in the 17 months since the agency received authority to investigate EFT fraud. In one six-month period, the Secret Service received 1,415 EFT fraud referrals.

"We can only expect the spiral to continue as the government converts more and more to electronic transfers," he said.

Simpson noted that the Secret Service investigates only cases involving U.S. Treasury Department funds, such as pension checks. "Luckily, at this point, these fraud cases have involved relatively small dollar amounts," he said.

They are typically "deceased payee" cases, where survivors continue cashing a dead person's checks, costing the government $200 to $45,000.

However, criminals are increasingly finding fraudulent ways to have the government electronically deposit checks into accounts that the criminals can access through automatic teller machines.

Simpson pointed out another criminal threat of potentially huge proportions — the manipulation of software in any one of a number of federal agencies to siphon off some of the $600 billion the government collects and the $900 billion the various agencies pay out each year.

Simpson warned, further, that the proliferation of personal computers could threaten the $30 billion that U.S. corporations transfer by wire each day.

One of the Secret Service's strategies to combat EFT fraud, Simpson said, is preliminary investigation of EFT fraud cases, even if they prove too small to pursue, because agents can learn more about the criminals' tactics and the victimized organization's weaknesses.



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High school hacker to undergo counseling

By David Olmos
CW Staff

LITTLE ROCK, Ark. — A 15-year-old high school student who admitted he tapped into the district's computer system to change his grades will undergo counseling at a mental health clinic for the remainder of the school year.

The unidentified sophomore told school officials that he gained access to student files stored in the district's Honeywell, Inc. DPS 8/44 mainframe and raised his grades and those of one other student, according to Bobby Lester, assistant superintendent for the Pulaski County Special School District. The student used a telephone and a Victor Technologies, Inc. VIC 20 home computer to break into the system late at night, Lester said.

The break-ins were discovered last December after school officials noticed that some grades had been changed. The computer's telephone access number was changed, and a tap was placed on the line.

During a two-week period in January and February, the student made six unsuccessful attempts to enter the system. The calls were traced to his home telephone number, Lester said.

"We approached him with this [information], and he admitted his guilt," Lester said. No criminal charges will be filed.

Although the student was not enrolled in any computer classes, Lester said, he had shown an interest in how the district's computers worked. "He doesn't get good grades in school, but he's a very bright student."

Before discovery of the break-in, the student had sent an anonymous letter to the director of the computer center in which he described how the system could be entered.

Under district policy, students found guilty of gaining unauthorized access to the computer are given two options: expulsion or placement in the Fullerton Adolescent Center, a state-run mental health clinic. The policy was established last December after two previous computer break-ins.

In one of those instances, a student created a fictitious course schedule for Mickey Mouse. In another, a student gained access to personnel records containing teacher salary data, Lester said.

As a result of the latest episode, the district has tightened security on its system. Junior high and high school students who use the district's more than 200 terminals are no longer given the codes that allow them to access the system — teachers now have to key in the codes themselves.

"You'd like to operate on an honor system," Lester said, "but you can't do it in a situation like this."

Software institute changes name

SUNNYVALE, Calif. — The Institute for Software Engineering has changed its name to the Institute for Information Management. A division of Boole & Babbage, Inc., the institute provides educational, publishing, research and consulting services to information management clients.

The name change was made, according to the institute's assistant general manager, Dr. Leilani Allen, "primarily because the whole thrust of our efforts has increasingly become oriented toward information as a resource, information as an asset." Allen added that the institute has come to focus as much on hardware and management issues as on software.

The institute publishes the *Journal of Capacity Management* and *Information Executive: The Journal of Information Economics* and operates a graduate degree program in information management.

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NEWS

Modeling tool tightens manufacturer's cash-flow control

GLENVIEW, Ill. — A worldwide manufacturing firm here improved its long-range planning and tightened its control over cash flow when it augmented an in-house reporting system with a financial modeling and analysis package.

Signode Industries, Inc. is a leading manufacturer and distributor of strapping systems for use in packaging and materials handling. A $700 million company, Signode manufactures a wide variety of products sold in over 100 countries in such diverse fields as forest products, steel, printing and food. The company employs some 6,000 people and has 26 manufacturing locations in Europe, Asia and South and North America.

Signode's data processing department recently developed a managerial reporting system that runs under IBM's MVS operating system on an Amdahl Corp. 580 Model 5860 mainframe. Known as the Executive Information System (EIS), the reporting system is comprised of both internal operational data and external economic and competitive information. It displays data, reports and graphs on IBM 3279 color terminals operated by light pens.

To improve the range of its financial planning capabilities, Signode sought a software system for modeling and "what-if" analysis. "We looked at three outside packages and also considered developing the financial modeling system in-house," Regis Uskup, vice-president of computer services, explained. "We made up a test problem with our own data, and we put all the packages through their paces. We had almost 24 separate criteria — each assigned a different weight — that we used to judge each package."

Costly in-house effort

Uskup estimated that to develop the software in-house would have cost five or six times as much as the outside system Signode eventually selected — the System W modeling and analysis package from Comshare, Inc. System W, he said, works in conjunction with EIS through the MVS operating system.

"With System W, we can do the types of financial analysis we used in a timely fashion and at less cost. With our programming capabilities, we could have delivered the kinds of answers System W generates, but we couldn't have done it on a timely basis."

Uskup said that System W has given Signode's managers financial modeling capabilities that help them manage the firm's large debt position on a short-term and long-term basis.

"Because of the nature of this business," Uskup said, "our debt position and our cash flow are extremely important, and the timeliness of that information is critical. System W allows us to monitor our cash position very carefully on a daily basis. It has also helped our planning by identifying for executives the factors behind key indicators such as cash flow, earnings or growth. That has sharpened our understanding and allowed us to put appropriate emphasis on the right areas."

After Signode acquired System W, the financial planning department worked with Uskup's staff to develop a one-year planning and budgeting system. "Once those reports were automated on System W, they could be done in a matter of hours, and I gained three man-months for my staff," said Frank Presecky, assistant controller for financial planning.

Uskup said System W will be an "information center offering" in the future. Signode is currently installing an IBM Model 3033 mainframe that will be devoted entirely to end-user computing, he said, including financial modeling and analysis with System W.

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TURNAROUND TIME

Larry Long

Q We were informed about three months ago that our division would be merged with a recently acquired division and that both would be moved to the Southwest during the last quarter of 1984. Some employees will be asked to transfer, but their names have not been announced.

I am the director of a small computer center that may or may not exist after the move. I'm willing to make the move, but my manager continues to say that it is too early to determine who will be transferred and who will join the unemployed. How can I encourage him to make these important decisions so that we can make plans?

A I would not even try. Your boss is either inconsiderate or using you, and I suspect the latter. I would suggest that you update your resume, and seek employment elsewhere.

Q Until a few months ago, I worked for five years in a dead-end position editing technical manuals. I transferred to a more challenging position with a newly formed documentation group in the management information systems department. The job is definitely challenging, but nobody told me about the frustration.

There are three of us in the group, and none of us has a computer background. Our jobs, as they were described to us, would entail the writing of user systems manuals and, perhaps somewhere down the road, some user education manuals. We were to take the system write-ups provided to us by programmers and analysts and write "user-friendly" manuals.

The three of us are part of the systems and programming section, and everybody seems to think that our function is to document their programs, as well as write the user systems manuals.

Programmers literally dump program listings on us. Then they ask us to prepare flowcharts and document program listings. When we approached our boss and told him that we didn't feel qualified enough to do this kind of documentation, he told us to learn.

Do documentation specialists in other companies document programs?

A Documentalists involved in program documentation would normally clean up completed but rough documentation that is provided by programmers. It is extremely inefficient to ask someone not involved with designing the logic and writing the code of a program to document it. First of all, documentation is a by-product of the development process, not something that is done hurriedly after a program is running. Second, the original programmer is in a much better position to produce documentation than you.

Documentation is viewed by many as an unpleasant task that is either done haphazardly or, if possible, avoided. To these people, the establishment of your group meant no more documentation.

A well-written program is usually accompanied by good, but not necessarily clean, documentation. If your job description continues to include program documentation, then it should be a clean-up operation.

Programmers should be given minimum documentation standards that must be met before programs are submitted to you for final documentation.

Q A recent career change took me back to college to study programming and information services. In a previous incarnation, I worked in sales and marketing. The reason I chose the computer field was the potential for jobs and career fulfillment.

At this point, neither seems attainable. I have made myself available for any type of computer-related position and have done everything possible to seek employment, from answering newspaper ads to sending out large mailings. I always get the same response: "Call us in two years."

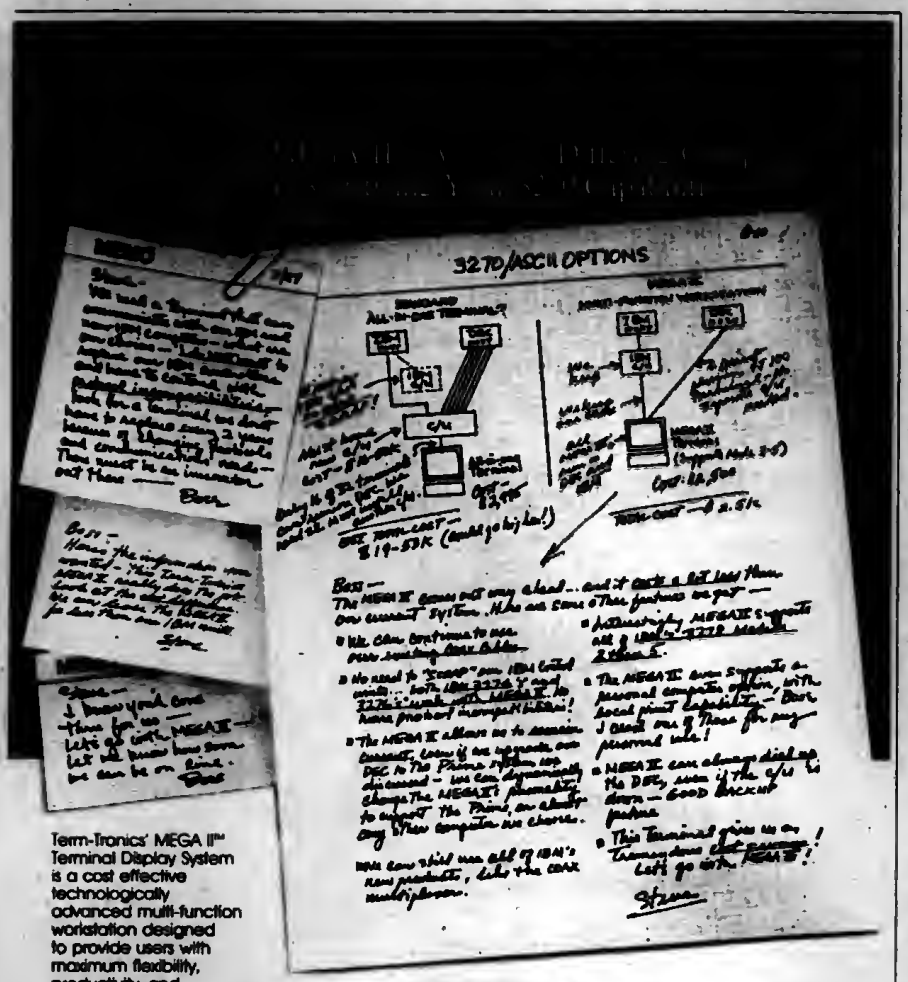
Don't employers realize that they will soon run out of people with two or three years' experience? Has it ever occurred to these employers that recent college graduates could be an invaluable investment in their futures?

A Recently, I asked a room full of MIS managers if they had openings for programmers or analysts. Then I asked them if they planned to fill these slots with experienced personnel or with recent graduates. All but one responded that they had openings, and all of those indicated that they were seeking only experienced personnel.

The problem persists, but, I hope, not for long. Most said that they were having considerable difficulty recruiting qualified people.

The conversation that ensued painted a grim picture for those seeking experienced personnel. As we talked on, I and others touted the value of recent grads, and several vowed to return to the college market. I hope this starts a trend.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.



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According to Ernest Owens, Director of the Department's Bureau of Information and Computer Services, MAPPER has put the Department 2½ years ahead of schedule in implementing this and other computer systems. It has enabled only three programmers to accomplish what would otherwise have occupied 45 programmers, fulltime.

The fact is, MAPPER is broadly applicable to just about any task, from the routine to the highly specialized. Owens' people have used MAPPER to develop 27 applications so far, with twice that number in the works.

As Ernest Owens sees it, "If you have a creative mind, there is no end to where MAPPER can take you."

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SPERRY

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IBM users group chooses officers

CHICAGO — John E. Nack, manager of the processing and network division at Caterpillar Tractor Co. in East Peoria, Ill., has been elected president of Guide International, the association of users of large IBM systems.

Other officers include Eddie G. Dapew, manager of application development for Monsanto Research Corp. in Miamisburg, Ohio, elected vice-president/administration; John Pullam, national manager for data processing at Simpsons-Sears Ltd., Toronto, chosen as vice-president/conferences; Janet S. Smith, manager of the systems development division at Railinc, Washington, D.C, elected vice-president/planning & finance; and Gary S. Gesme, manager of resource evaluation, performance and capacity planning divisions at Deere & Co., Moline, Ill., chosen as vice-president/divisions.

Guide's 2,500 members meet three times a year.

Blis/Cobol meeting set for May 12-17

LAKE BUENA VISTA, Fla., — The Blis/Cobol Users Group has scheduled its annual meeting for May 12-17 at the Dutch Resort Hotel here.

Events and classes will include sessions on communications between Blis/Cobol and microcomputers, advanced programming efficiencies, hardware manufacturers' presentations, future enhancements of Blis/Cobol and reviews of the operating system.

The registration fee for members is $125 and $175 after April 1. The cost to nonmembers is $325 and $375 after April 1.

Additional information is available from the Blis/Cobol Users Group at Suite A, 450 Wymore Road, Winter Park, Fla. 32789.

Application monitoring	Unlimited number standard
Individual transaction record available	Yes
Network alarms	33 types
Immediate display of network alarms	Yes
Intelligent line data display	Yes
User-programmable automatic alarms trap	Yes
Protocol discrepancy alarms	Yes
Line utilization analysis	12 real time and 30 databased components
Network configuration recognition	Automatically generated and verified
Entire database available to host	Yes
Local (non-host) database	Yes
Low maintenance design	Yes
Special A.C. power	None required

HRSP forum to discuss people, data

FORT WORTH, Texas — The Association of Human Resource Systems Professionals, Inc. (HRSP) will hold it fourth annual conference, "People, Data and Systems . . . Putting It All Together," at the Hyatt Regency here May 20-23.

The conference plans to examine automated personnel information systems and human resource management needs served by such systems.

Twenty-four workshops and six roundtable discussions are scheduled. Workshop topics will include position control, salary forecasting and office automation.

The seminar costs $400 for HRSP members and $500 for others. Additional information is available from HRSP, which is located at 3051 Adeline St., Berkeley, Calif. 94703.



NEWS

Utility helps service firm perform quality assurance

DENVER — Randall Smith, production control manager of a bank service company here, started looking last year for ways to streamline the operation of his newly formed quality assurance group.

He wanted to find a utility that would help the internal auditors compare two versions of one program as well as allow programmers to perform data comparisons and point out the changes.

Smith's department had been promised a number of tools to help audit system modifications in programs used at Affiliated Bank Services Co. (ABSC). "A file comparison utility was something that I thought could help that department intelligently pursue its goal," Smith said.

He needed a utility that would run on the firm's IBM 3083 mainframe under MVS, one that could be used by both internal auditors and programmers. "There is an IBM utility that does crude comparisons. It will tell you two files are different, but won't say how or do any analysis," Smith said. He knew right away that the IBM utility didn't fit ABSC's needs.

Although several other companies' products were considered, ABSC only tested seriously Comparex from Sterling Software Marketing of Sacramento, Calif., a much less expensive utility by Harlan S. Hersey, Inc., and Quality Systems Corp.'s Res-q.

Comparex has two modes of comparison, a test mode that synchronizes by lines and a data mode that synchronizes by keys (fields). For comparing checking out system changes in files, the data mode has proved to be more appropriate.

Comparex can handle all file organizations, including Vsam, Isam and partition data sets (PDS). At ABSC, Vsam is generally used because of its high speed. Comparex allows comparison of source code, object code and load modules.

Its PDS (library) function can compare all members, new members only or directory members, based on a wild card. "No matter what you come up with, it can be matched," he said.

There is also some screening ability. "We could say we only wanted members starting with XYZ or even ending with XYZ," Smith said.

Some of the features of Comparex that particularly appealed to Smith were the I/O options. "You can squeeze characters out, which was useful for our purposes. If you specify that you want blanks ignored, that's what it will do," Smith said.

Comparex can compare a file from the beginning down to a certain point or from the end up, but it cannot compare a section somewhere in the middle, Smith pointed out. The Quality Systems' utility had the ability to take a section out, which was a point in that firm's favor.

Smith decided to go with Comparex. The result of the Comparex installation, which was purchased in late September, seems to be an increase in quality, though specific improvement has not yet been gauged.

Most of the code at ABSC is purchased, according to Smith. The programmers are pleased with the addition of the comparison utility because it makes it easy to determine changes that have been made to the programs that have been bought.

"We justified the purchase on less than 1% efficiency. There has been an increase in quality, I've been told, but I couldn't say how much," Smith said.

The one thing missing from the Comparex utility is a direct interface to Panvalet, a library control system from Panaophic Systems, Inc. "I've suggested the addition of a Panvalet interface, which may be added by this time," Smith said. "

CCA EMACS

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CCA EMACS from Computer Corporation of America has the greatest combination of power, speed, and functionality of any text editor available for Unix or VAX/VMS. With close to 400 built-in commands, CCA EMACS allows virtually any editing task to be accomplished in just a few keystrokes, including tasks that would be difficult or impossible to do using other editors. In addition, a set of more than 80 predefined variables allows each user to customize CCA EMACS to meet various application needs and user styles. All of these features are supported by a full online documentation package that can assist the user at any point, giving information that ranges from the definition of a single command to manual pages that contain complete explanations of major CCA EMACS features.

Operating Environment

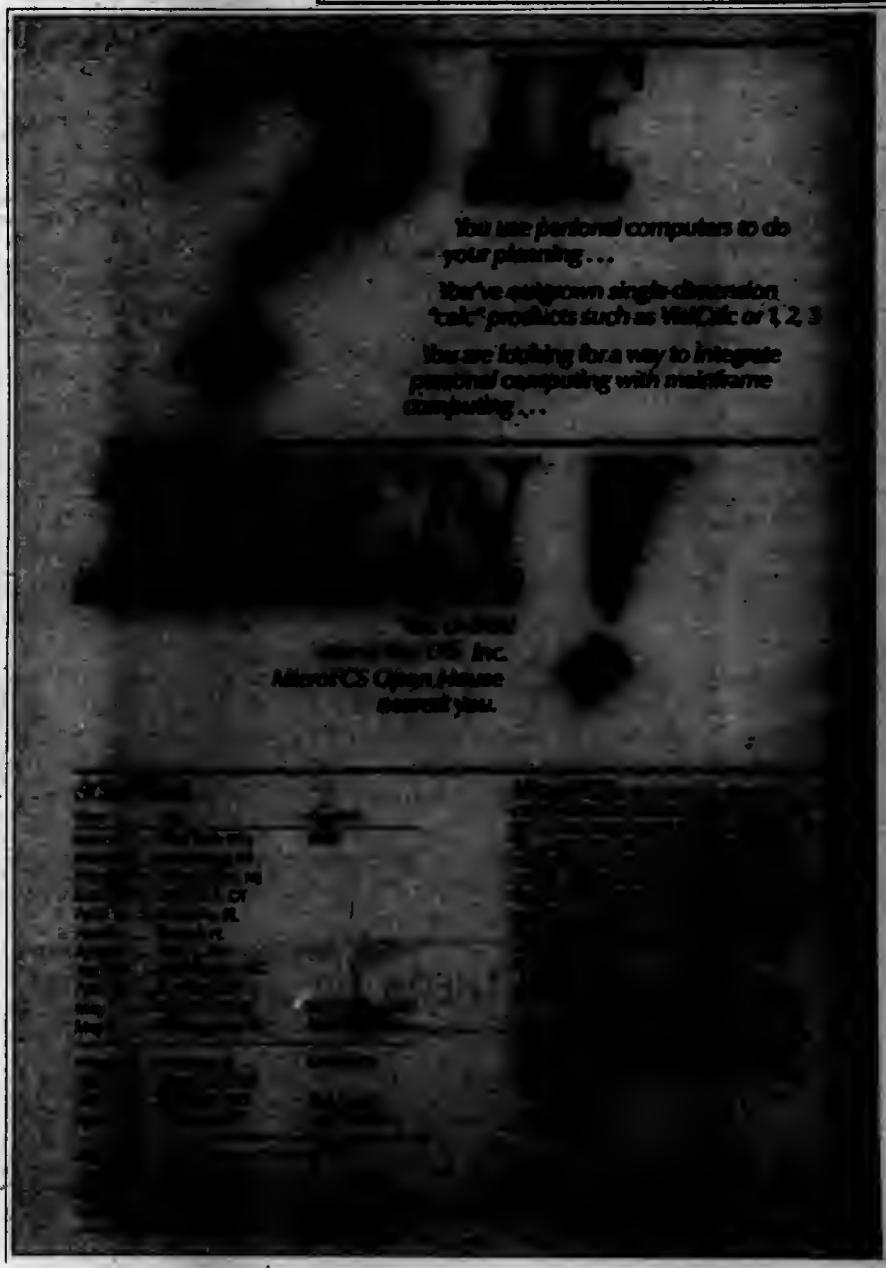
Runs on Berkeley Unix (4.1BSD and 4.2BSD), Bell Unix (System III and System V), and VAX/VMS. Requires 500 K of address space.

Price

Prices for a full source license range from $350 to $2400. Contact CCA for further details.

For More Information Contact

Computer Corporation of America, Four Cambridge Center, Cambridge, MA 02142
(617) 492-8860
OEM inquiries are encouraged.
(1) Unix is a trademark of Bell Laboratories.
(2) Vax and VMS are trademarks of Digital Equipment Corporation.



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Subscription service credits its swiftness to on-line net

BIRMINGHAM, Ala. — One of the world's largest subscription agencies credits its swiftness of service to an on-line data communications network that can handle 130,000 daily transactions.

Fifty thousand organizations in more than 50 countries rely on Ebsco Subscription Services (ESS), a division of Ebsco Industries, Inc., to deliver periodicals needed by researchers, executives, technical experts, students and professors. In 1982, it handled millions of subscriptions to 160,000 unique titles that were delivered to 420,000 addresses.

"We're a one-stop supermarket for anything published on an ongoing basis anywhere in the world," said F. Dixon Brooke Jr., vice-president of operations. "That includes newspapers, periodicals, monographs and government publications, as well as videotex and microforms."

Subscription services

According to John Krontiras, vice-president and general manager of data processing, about 70% of his 83-person department's work load relates to subscription services. "That's understandable, given the size of the data bases we manage," Krontiras said.

"We add an average of 17,000 titles a year to a data base that now includes more than 160,000 titles offered by some 55,000 publishers. On each title, we keep complete pricing and bibliographic data, involving about 10,000 record changes each month.

"Also, since a single corporation may subscribe to 500 periodicals for distribution to offices in dozens of cities, our files include not only 50,000 bill-to addresses, but 420,000 ship-to addresses," he added.

"Because ESS is growing, our data processing requirements keep expanding. In 1979, we processed about 1.5 million subscription orders. During 1982, we handled more than 4.2 million orders. And a single order may represent many subscriptions," he said.

This constant ESS growth has made Ebsco an expert at computer system upgrades. Since the privately held company installed an IBM 1130 computer in the mid-1960s to begin subscription service automation, it has migrated through several series of IBM processors.

With its 1982 upgrade, Ebsco stepped up to twin 3M-byte IBM 4341 Model Group 2 processors with 25G bytes of disk storage capacity.

In recent years, on-line requirements have driven DP activities. Ebsco dedicates one IBM 4341 system to on-line operations, supporting an internal network that embraces 250 IBM 3278 display stations located in 14 U.S. and foreign Ebsco offices, 10

See EBSCO page 40

WIP to host conference April 6-8

PHILADELPHIA — The Advance 1984 International Conference, sponsored by Women in Information Processing (WIP), will be held April 6-8 here at the Bellevue Stratford Hotel.

Amy Wohl, president of Advanced Office Concepts Corp., will deliver the keynote address. The conference, for managers, professionals, users and students of information processing, will focus on subjects ranging from fifth-generation computing and artificial intelligence to career development and stress management.

Registration fees are $240 for WIP members and $290 for nonmembers. Further information is available from WIP, Lock Box 39173, Washington, D.C. 20016.

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We're back



Gamewell also makes computer-based fire warning systems.

Move on-line provides manufacturer with up-to-date inventory information

MEDWAY, Mass. — Increased business, up-to-date inventory information and accurate work-in-progress reports were the chief goals set by Gamewell Corp. in converting from the batch processing of manufacturing data to an on-line, interactive system. Gamewell, which has been manufacturing fire protection equipment since 1852, has its offices and its plant here.

"When I came here in 1981, we had a batch processing system running on a 10-year-old computer," MIS Director Andreas B. Greuter recalled recently. "Given the size of the company, it was a very advanced system for its day. However, time has overtaken it. Our business had progressed to the point that only a complete overhaul would do."

The search to replace the existing IBM System/3 Model 10 was spurred by significantly increased business: Gamewell's sales had doubled from 1978 to 1982. On-line, up-to-date information was essential for the improvement of material management, but the old system was able only to compute costs after jobs were finished. It had no accurate ability to report exactly what the status of each job-in-progress was and what labor and material costs had been charged to it.

"With the batch system, the inventory was updated, and a report was printed weekly," Greuter said. "After a couple of days, the report was out of date and we began to lose track of the inventory until the next report was printed. Some items are critical to production, so we had to watch their actual counts closely."

Greuter and his staff considered updating the existing system, but decided against "a stopgap approach that might work for another two or three years. . . . We wanted to provide a tool for the future — perhaps something that could serve us for the next 10 years."

Most hardware vendors wanted Gamewell to use outside software houses either to develop the needed programming or to modify the vendor's programming to fit Gamewell's needs. But, Greuter said, "We wanted to deal with a company that could furnish the computer, the software and the software modifications."

The vendor's ability to modify the programs was particularly important, he added; the Gamewell DP department consists of a DP manager, his assistant and two part-time computer operators. The group had neither the time nor the programming expertise to undertake major modifications.

The system selected was NCR Corp.'s 9040 computer with NCR's Interactive Manufacturing Control System II (IMCS II) software. The computer had 1M byte of main memory and 136M bytes of disk memory. It was installed in August 1982 with 13 CRT terminals at various locations in the office and plant. Already, according to Greuter, an additional 1M byte of memory has been added to accommodate a total of 28 terminals.

The IMCS II software

See IMCS page 40



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EBSCO from page 38

IBM 3279 color display stations as well as 20 daisywheel printers in regional offices.

The system also supports Ebsconet, an expanding external customer network. Within 18 months of introducing Ebsconet, the company found itself supporting on-line terminals at more than 130 customer locations.

Info-handling business

"We're really in the information-handling business," Brooke said, "and the ability to order periodicals via computer terminals isn't the main reason customers want our on-line services.

"Rather, they want to tie into our data bases to gain instant access to the information they need to make prompt, intelligent decisions," he added.

Work began in 1977 on an on-line pilot project to link the University of Alabama's Lister Hill Library of Health Sciences to Ebsco's computer system.

For this pioneering effort, Ebsco modified a software package acquired from the University of California at Los Angeles biomedical library. Now Ebsco provides the resulting Serials Control System and an On-line Subscription Service (OSS) to libraries and information centers.

Given about 24 hours, Ebsco can link any customer computer terminal to its host IBM 4341 computer and its central data base, which contains both separate and merged files, according to Brooke. Dial-up access is provided through Tymnet, Inc. telecommunications services.

Eliminated tedious tasks

OSS has automated many tedious and time-consuming manual subscription tasks. The cost of processing new orders is estimated at $20 to $75 per title for organizations using manual methods.

But with individual customer order requirements and complete title data built into Ebsco's data base, an OSS user can place an order in about 30 seconds.

"Our network uptime is now greater than 98.5%," Krontiras said. "Ebsco staffers and customers making 130,000 on-line transactions daily can count on a response time of four seconds or less.

"We've achieved this performance by converting from Bisynchronous Communications to an IBM Systems Network Architecture telecommunications environment, adding hardware and software monitors and dedicating staff to data communications," he added.

Each Ebsco regional office is equipped with an IBM 3274 control unit, while an IBM 3705 communications controller at headquarters handles all incoming lines.

State-of-the-art diagnostic tools, including a Digilog, Inc. network supervisory system, enable Ebsco to isolate and solve problems immediately.

The Digilog system takes advantage of IBM CICS software.

Krontiras lists CICS as one of a half-dozen valuable IBM network software aids.

IMCS from page 39

package is modular, with up to nine application modules interacting through a common data base. As an example, the inventory data shows, in a real-time mode, the quantity put to stock within the purchasing/receiving module, the quantity a production order has been opened for in an inventory-control screen and the quantity entered as shipped against a sales order in the order processing module, which was modified to meet the company's needs. There were problems making the transition, according to Greuter, but nothing insurmountable.

In addition to maintaining the perpetual inventory, the programming makes it possible to cycle count the physical inventory and come up with increasing accuracy. Based on the results obtained so far, counting 130 different parts each week, Gamewell is confident that cycle counting will replace the annual wall-to-wall physical inventory.

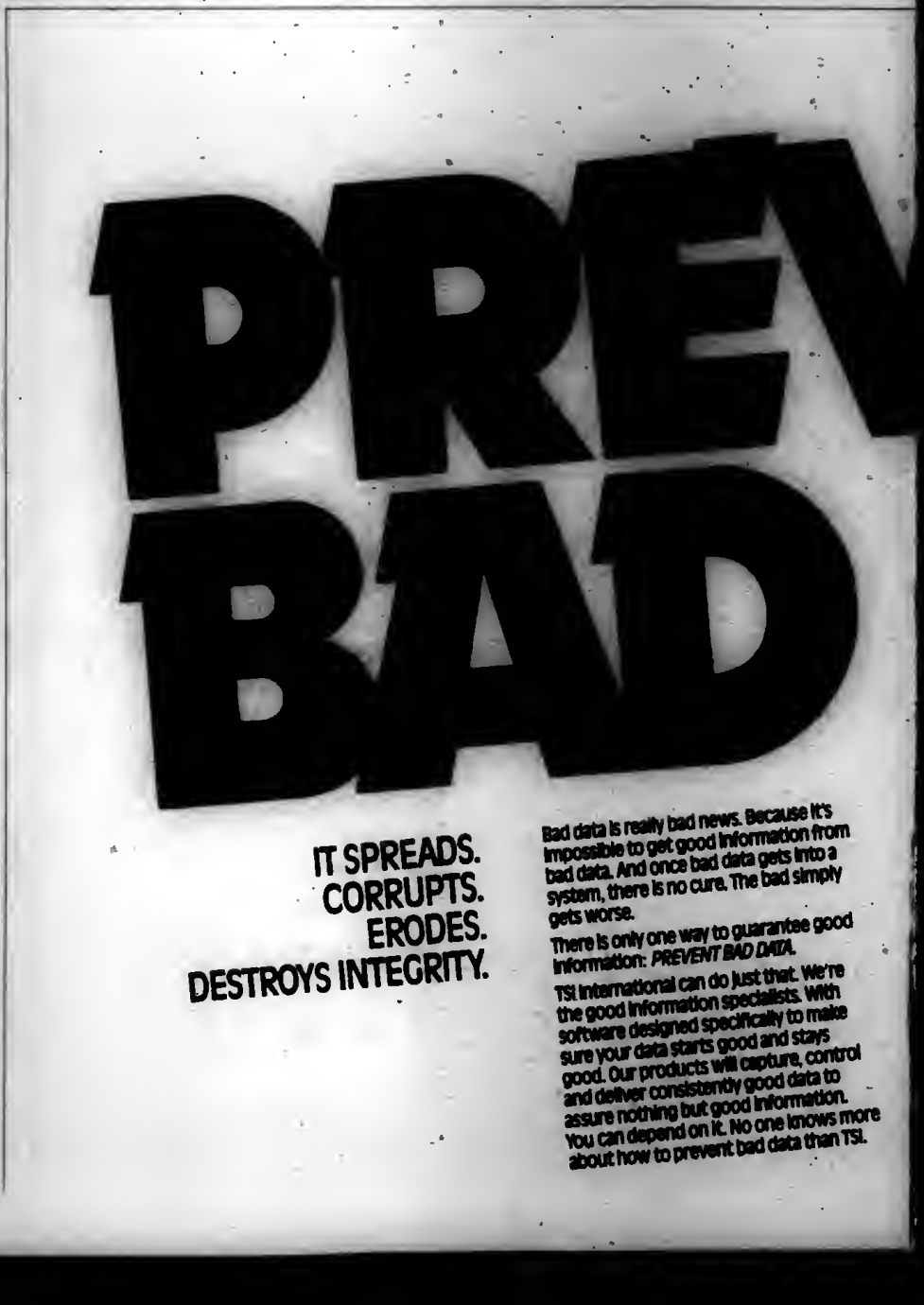
Greuter feels the new system is meeting the objectives set for it. "Our bottom line with this new system was to provide our people with a tool consisting of up-to-date management information. Since we started placing terminals in the plant, we have seen a steady increase in their use. That acceptance is probably the best recommendation our people can give."

ASI launches four courses

ARLINGTON HEIGHTS, Ill. — Advanced Systems, Inc. (ASI), a producer and distributor of on-site training courses for large organizations, is offering four multimedia courses dealing with technology and work center management.

"Managing the Economics of the Advanced Stages" is said to provide corporate executives with an overview of the value of computers. The other programs are "Technology Perspective: Harnessing the Productivity Potential of MVS/XA," "Work Center Management" and "Dispatching and Shop Floor Control."

The programs range in price from $50 to $100 per tape, depending on the leasing arrangement. They are available now from ASI, 2340 S. Arlington Heights Road, Arlington Heights, Ill. 60005.



Package enables insurer to control forms inventory



Unionmutual building

PORTLAND, Maine — When a major insurance company here began to lose control of its inventory of 15,000 printed forms, it turned to a software package for assistance.

A leader in the field of long-term disability insurance, Unionmutual Life Insurance Co. has grown nearly tenfold in the last decade — its assets increased from $378 million to $3 billion in the period from 1978 to 1982 alone. The firm's need for printed forms grew just as rapidly. The burgeoning inventory of forms had been controlled through a manual card file system, but duplicate purchasing orders, recurring inventory shortages and order fulfillment delays made it obvious that it was time to automate.

A Unionmutual study team determined that a packaged software system would be more cost-effective than one developed in-house by the company's programming staff. Management representatives then visited other firms with automated inventory control systems, including the First National Bank of Boston. First National had implemented Management Science America, Inc.'s (MSA) Inventory and Purchasing System package.

Unionmutual considered several other packages, but decided upon the MSA Inventory and Purchasing System because it was the only package that could calculate consumption — or usage — rates on an ongoing basis, according to senior programmer/analyst Frank Rivera. Turning to the task of implementation, the project team first reviewed the card file information and simplified it to the bare essentials.

Next, data from the three card files in the supply, forms management and purchasing departments was entered into the system. Unionmutual continued to use the manual system in conjunction with the MSA package — a parallel run of sorts — until staff members were satisfied that the automated inventory system was completely functional.

Workers soon found that referencing an inventory item was much easier with the new system. "The project team chose to use the final five positions of the item description to indicate the latest date of any printed revision," Rivera said. "Our legal department, for example, may be doing research and needs to know which long-term disability claim form was used in New York in 1972. With the Inventory and Purchasing System, we can have an answer in minutes."

Currently, Unionmutual runs the MSA package on its IBM 3081 mainframe under MVS to keep track of 15,000 forms used in the more than 90 offices it maintains nationwide. The system has made it possible for Unionmutual to group forms by name as well as number. The categories, such as application, claim, policy page and proposal, are listed alphabetically in the supply catalog. In addition to standardizing naming conventions within the company, that feature has been useful to employees unfamiliar with the form numbers.

But the biggest advantage of the MSA software, according to Rivera, is that the firm can determine on an ongoing basis the number of forms used. "Because we're growing so fast, our average monthly usage is changing. The system not only tells us how many more months our present stock is going to last, but also where our reorder points should be set.

"We can review our information periodically and make the necessary changes," Rivera said. "This has given us one central place to access the information we need."

Because purchasing can project printing needs more accurately, Unionmutual can avoid emergency buying and negotiate with vendors for the best possible prices. The system has also helped the firm identify forms that are similar from a printing aspect, Rivera said, and that capability has allowed Unionmutual to combine form orders to reap the benefit of competitive bidding for larger orders.

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Ford goes in-house for structural analysis

DEARBORN, Mich. — Analyzing more than 12,000 individual finite elements on a car body and 11,400 on the engine block is a task that Ford Motor Co. engineers here can only accomplish with the aid of computers.

"It is only with powerful computers and software that we are able to identify possible weak spots, simulate operations and analyze results," explained Dr. P. Perumalswami of Ford's Structural Analysis Department.

The Structural Analysis Department is a focal point for company-wide use of finite-element technology, he said. The department develops new methods, trains personnel and offers consulting and analysis service companywide, besides undertaking large and complex analysis tasks such as vehicle structures, power-train assemblies and dynamic studies.

The department serves "a couple of hundred users" via telephone lines, according to Perumalswami, and additionally provides time-sharing services to Ford engineers in the U.K. and Germany.

Ford has used computers to analyze car structures and components since the early 1970s. Then, the company was using Control Data Corp.'s Cybernet Services' cadre of Cyber 18 computers, which eventually numbered nearly 200, to develop a structural analysis operation. Now it operates two computers in-house, a CDC Cyber 176 and a Cyber 760.

The Cyber 176 and 760 in Ford's Dearborn Engineering Computer Center are the major tools for Ford's companywide structural analysis program. The computers enable designers and engineers to create mathematical models of surfaces, structures and components and to simulate performance for evaluation and change, if necessary.

The switch from Cybernet to in-house came in 1977, when Ford acquired the Cyber 176; the 760 was installed in January 1983. According to Perumalswami, engineers and designers have access to "Mainframe A" and "Mainframe B," depending on which is available. "We don't distinguish between Mainframe A and Mainframe B," he said. The computer operation accommodates batch processing, on-line processing and time-sharing.

The department's library of mathematical models and simulations is very extensive. "We subject the car and [its] select parts to all types of road conditions, even down to testing the curb-impact capabilities of the wheel rims."

Perumalswami said the ability to analyze 12,000 elements on a car body and 11,400 on an engine is a major advantage. "We've always been aware of where major stress and weak spots could occur, but could not identify those trouble areas that come with time and extensive use. Now we can subject body, engine and components to whatever tests we wish."

Ford's European operations in the U.K. and Germany rely on the Cybers in Dearborn for large-problem processing. The company's European Automotive Operations, headquartered in Dunton, U.K., is equipped with a Cyber 720, but is connected by a 9600 bit/sec satellite transmission network to the Dearborn center's Cyber 176. The Dunton Computer operations, in turn, serve a Ford research center in Merkenich, Germany.

"Because of the time difference, the time-sharing works very well," Perumalswami noted. "The European operations begin transmitting data around 1 a.m. our time, and the processing is usually completed by the time engineers in Dearborn need the computer."

Ford uses MacNeal-Schwendler Corp.'s MSC Nastran (Nasa Structural Analysis) software for about 90% of its analytical work. But it also has developed a broad range of subsystems that interface with Nastran to meet specific design and engineering needs. These programs and other commercially-available codes support a wide spectrum of analyses that relate to crash tests, structural effects of thin body parts, placement of engine mountings, vibration studies, bumper design and many others.

One such application is Ford's Movie.Byu, a software package that uses shades of color to pinpoint areas of high stress and structural weakness. When loads and constraints are applied to a particular part of body surface, the weak spots become obvious through color coding.

Ford's around-the-clock structural analysis computer center is supported by a staff of approximately 50 analysts. About 20 disk packs are mounted daily to handle the work load. Data storage is handled by 17 CDC 844 disk drives and 12 CDC 885s, for a total capacity of 15.6 billion bytes of information.

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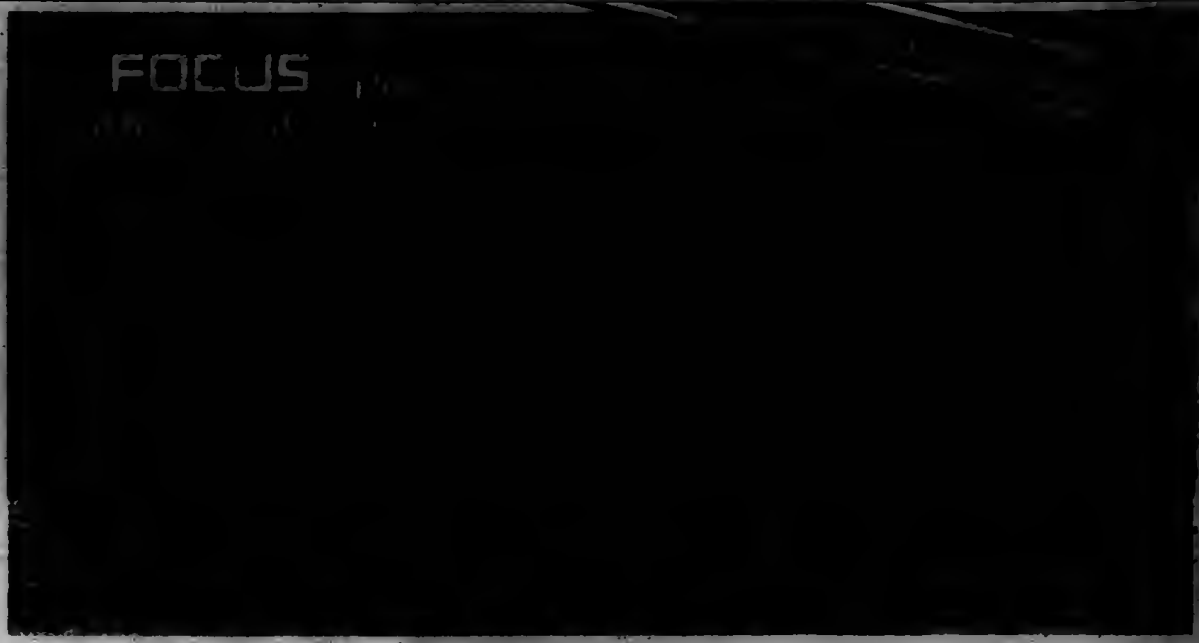
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NEWS

CALENDAR

WEEK OF APRIL 1

APRIL 3-6, BOSTON — **Structured Design and Programming.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045.

APRIL 4, NEW YORK — **Introduction to Dbase II.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

APRIL 4, NEW YORK — **IBM 8100 Users Group.** Contact: Con Edison, 4 Irving Place, New York, N.Y. 10003.

APRIL 4-5, GREENBELT, MD. — **Relational Data Base Systems.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

APRIL 4-6, HOUSTON — **Systems Analysis and Design: Concepts and Effective Practices.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 4-6, SEATTLE — **Data Base Management.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 4-6, SAN FRANCISCO — **Network Design.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

APRIL 4-6, NEW YORK — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 4-6, CHICAGO — **Fundamentals of Data Communication.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020. Also being held April 9-11 in Washington, D.C., and Philadelphia.

APRIL 4-6, SALT LAKE CITY — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 4-6, SEATTLE — **Layered Network Architecture and the ISO Seven-Layer Standards.** Contact: Data-Tech Institute, 386 Franklin Ave., P.O. Box 569, Nutley, N.J. 07110.

APRIL 4-6, SAN JUAN, PUERTO RICO — **Personal Computers and Networking.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held April 4-6 in Pittsburgh.

APRIL 4-11, HANNOVER, WEST GERMANY — **Hannover Faire.** Contact: Hannover Faire Information Center, P.O. Box 338, Route 22 E., Whitehouse, N.J. 08888.

APRIL 5, NEW YORK — **Knowledgeman for Application Development.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

APRIL 5-6, HOUSTON — **Data Communications: Advanced Concepts, Products and Services.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 5-6, NEW YORK — **Implementing Voice Technology.** Contact: Patti Bestaino, Votan, 4437 Technology Drive, Fremont, Calif. 94538. Also being held April 11-12 in Chicago, April 17-18 in Atlanta and April 24-25 in Dallas.

APRIL 5-6, PHILADELPHIA — **Microcomputers: A Tool for Increased Productivity.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held April 9-10 in Chicago and April 12-13 in Milwaukee.

APRIL 5-6, RESTON, VA. — **Local-Area Networks.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

APRIL 5-6, WASHINGTON, D.C — **Micro/Personal Computers: State of the Art.** Contact: Digital Consulting Associates, Inc., 339 Salem St., Wakefield, Mass. 01880.

APRIL 5-6, BOSTON — **The IBM Personal Computer: Making It Work in the IBM Mainframe Environment.** Contact: Techtran, P.O. Box 10212, 72 Cummings Point Road, Stamford, Conn. 06904. Also being held April 12-13 in New York.

APRIL 5-6, SAN FRANCISCO — **IBM Systems Network Architecture: A Master Plan for Teleprocessing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 5-7, NEW YORK — **The 1984 Lasers in Graphics Seminar.** Contact: Dunn Technology, Inc., 750 E. Vista Way, Vista, Calif. 92083.

APRIL 5-7, LOS ANGELES — **Comdex Winter 1984.** Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

APRIL 6, GREENBELT, MD. — **Relational Data Base Design Techniques.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

APRIL 6, NEW YORK — **Advanced PC-DOS 2.0.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

APRIL 7-8, NEW YORK — **CICS Command Level.** Contact: Syscd, One Park Ave., New York, N.Y. 10016.

WEEK OF APRIL 8

APRIL 8-12, ORLANDO, FLA. — **Synergism '84: Micro International's Ninth Conference for Microcomputer Users.** Contact: Micro International, P.O. Box 497, Barrington, Ill. 60010.

APRIL 9, KANSAS CITY, MO. — **Introduction to Micros.** Contact: U.S. Professional Development Institute, Microcomputers in Government, Department AB, 1620 Elton Road, Silver Spring, Md. 20903.

APRIL 9, NEW YORK — **Introduction to the IBM PC.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

APRIL 9, BOSTON — **The Telecommunications Future.** Contact: The New England Council, Inc., 120 Boylston St., Boston, Mass. 02116.

APRIL 9, NEW YORK — **Word Processing With Wordstar.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

APRIL 9-10, SAN FRANCISCO — **Local-Area Networks: Selection Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 9-10, OTTAWA — **Dbase II.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held April 11-12 in Toronto, April 16-17 in Calgary, Alta., April 18-19 in Vancouver, B.C., April 23-24 in Arlington, Va., and April 25-26 in Washington, D.C.

APRIL 9-10, ORLANDO, FLA. — **Computer Negotiations Workshop.** Contact: International Computer Negotiations, Suite 1707, 200 St.

See APRIL page 46

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Andrews Blvd., Winter Park, Fla. 32792.

APRIL 9-10, WASHINGTON, D.C. — How to Manage Data and Information as a Resource. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 9-11, ATLANTA — Data Communications: An Introduction to Concepts and Systems. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 9-11, NEW YORK — Minis/Micros with IBM Mainframes. Contact: Techtran, P.O. Box 10212, 72 Cummings Point Road, Stamford, Conn. 06904.

APRIL 9-11, WASHINGTON, D.C. — Distributed Systems Design: Microcomputers to Mainframes. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 9-11, ATLANTA — Computer Network Architecture. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

APRIL 9-11, CHICAGO — Data Base Management Systems for Micros and Minis. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 9-11, BOSTON — Microcomputer Data Base Management Systems. Contact: Digital Consulting Associates, Inc., 339 Salem St., Wakefield, Mass. 01880.

APRIL 9-11, LOS ANGELES — Controlling Software Projects: Management, Measurement and Estimation. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 9-11, NEW YORK — Information Systems: Modeling Analysis and Planning. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 9-11, NEW YORK — Data Communications and Networking for Personal Computers. Contact: Digital Consulting Associates, Inc., 339 Salem St., Wakefield, Mass. 01880.

APRIL 9-11, SAN FRANCISCO — Computer Operations Management: Effective Techniques. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 9-11, TORONTO — Data Base: A Manager's Guide. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 9-11, WASHINGTON, D.C. — Project Management: A Practical Approach. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 9-11, WASHINGTON, D.C. — Computer Performance Measurement and Capacity Planning: Tools and Techniques. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

APRIL 9-12, SAN FRANCISCO — Infocom '84. Contact: IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

APRIL 9-12, CHICAGO — FTI/Image Management. Contact: Association for Information and Image Management, Department of Conference and Exposition, 1100 Wayne Ave., Silver Spring, Md. 20910.

APRIL 9-12, ATLANTA — Basic Assembler. Contact: Advanced Technology Systems, Inc., 302 Research Drive, Norcross, Ga. 30092.

APRIL 9-12, WASHINGTON, D.C. — The Sixth Annual International Conference on Computer Capacity Management. Contact: Institute for Information Management, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

APRIL 9-12, ORLANDO, FLA. — Software Engineering With Ada. Contact: U.S. Professional Development Institute, Software Engineering with Ada, Department A, 1620 Elton Road, Silver Spring, Md. 20903. Also being held April 30-May 3 in Dallas.

APRIL 9-13, HOUSTON — Structured Analysis and Design Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held April 9-13 in New York.

APRIL 9-13, LOS ANGELES — Software Maintenance Workshop. Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

APRIL 9-13, DENVER — The Comten Users Ex-

See APRIL page 48

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Cullinane to keynote IEEE meet

SILVER SPRING, Md. — John J. Cullinane, chairman of the board of Cullinet Software, Inc., will be the keynote speaker at the 1984 Trends and Applications Conference (Trends and Applications '84), which will take place here May 23. The title of Cullinane's talk will be "Data Base Management Systems — Fact and Fiction."

Trends and Applications '84, sponsored by the Institute of Electrical and Electronics Engineers (IEEE) Computer Society, will be held at the National Bureau of Standards in Gaithersburg, Md. The theme of the conference is "Making Data Bases Work."

The registration fee for the two-day conference is $50 for IEEE Computer Society members, $60 for nonmembers.

More information is available from the IEEE Computer Society, which can be contacted through P.O. Box 639, Silver Spring, Md. 20901.

June 12 meet to discuss factory computerization

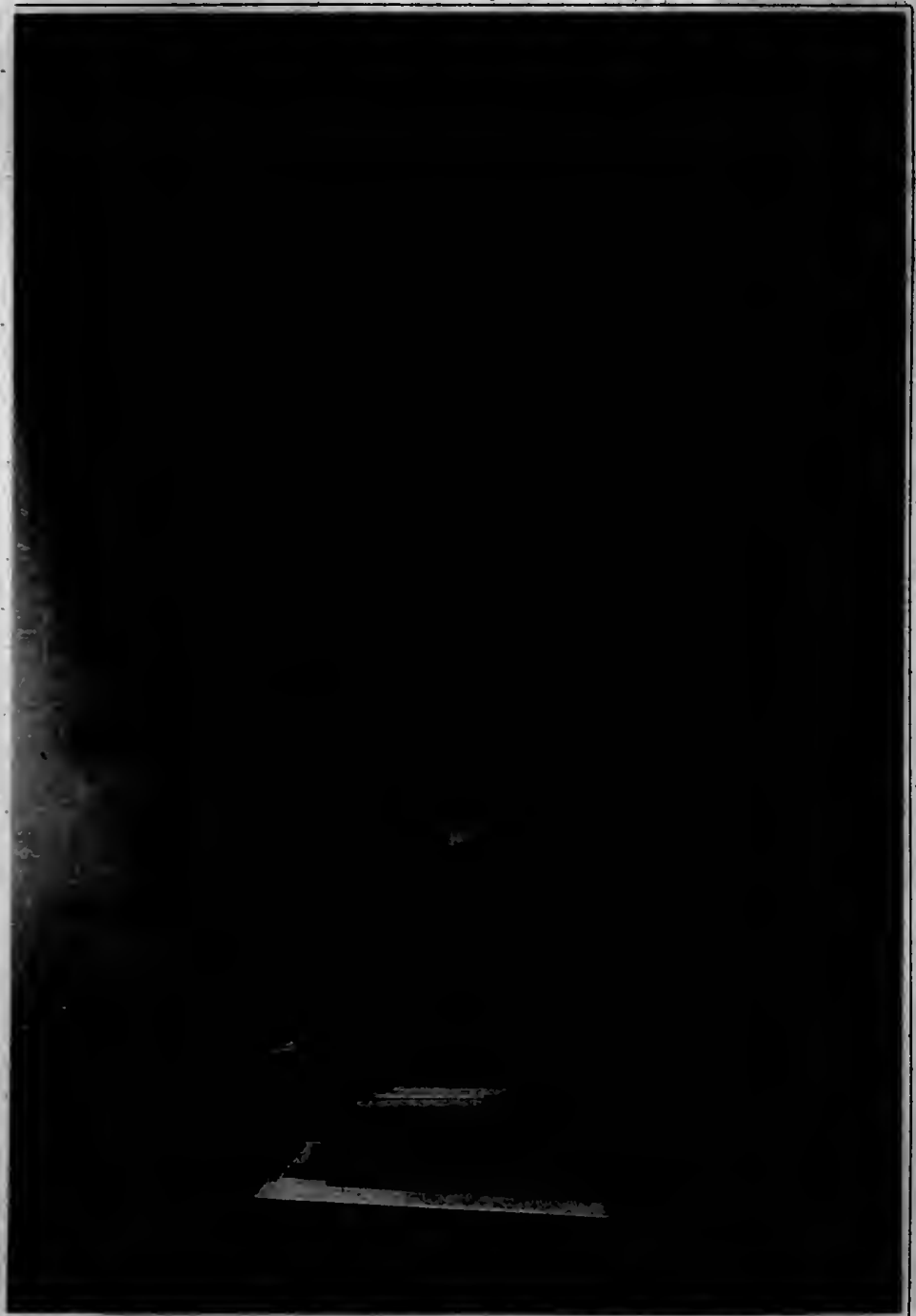
CHICAGO — The Advanced Manufacturing Systems (AMS) Exposition and Conference will be held at McCormick Place here June 12-14.

The theme of AMS '84 will be "The Computer: Mind of the Factory of the Future."

Information systems and automated production systems directed to the needs of manufacturing companies will be demonstrated.

The sessions and full-day short courses will cover aspects of computer-integrated manufacturing. Exhibits will include computer-aided design and manufacturing systems and peripherals.

Information on the exposition is available from AMS '84, 708 Third Ave., New York, N.Y. 10017.



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change Spring Conference. Contact: NCR Comten, Inc., 2700 Snelling Ave. N., St. Paul, Minn. 55113.

APRIL 9-13, SEATTLE — Contemporary Computer Auditing: Integrity Controls. Contact: Marge Umlor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

APRIL 9-13, LONG BEACH, CALIF. — Structured Analysis for Real-Time Systems. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

APRIL 9-13, SAN FRANCISCO — Unix System Workshop. Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

APRIL 9-13, CHICAGO — Structured Analysis. Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

APRIL 9-13, SAN FRANCISCO — Data Base Development. Contact: Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 9-13, PHILADELPHIA — Structured Analysis and Systems Specification Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

APRIL 9-13, NEW YORK — CICS Command-Level Programming. Contact: Syscd, One Park Ave., New York, N.Y. 10016.

APRIL 9-13, PHILADELPHIA — Systems Analysis Workshop. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181. Also being held April 23-27 in Toronto.

APRIL 10, NEW YORK — Spreadsheets Using Lotus 1-2-3. Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

APRIL 10, NEW YORK — Advanced Dbase II. Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

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EDITORIAL

Fujitsu: good for business

Users of Amdahl Corp. equipment who also happen to be fervent "Buy American" adherents are likely feeling a bit uneasy these days following the announcement that Fujitsu Ltd. of Japan will own just under 50% of Amdahl [CW, March 12].

But U.S. users of all types of information processing equipment may benefit from Fujitsu's acquiring what some analysts feel is de facto control of an established American firm.

Amdahl has not been a truly American business for some time now. Fujitsu has had three directors on Amdahl's board and has supplied a reported 20% of the components used in Amdahl's 580 line of mainframes.

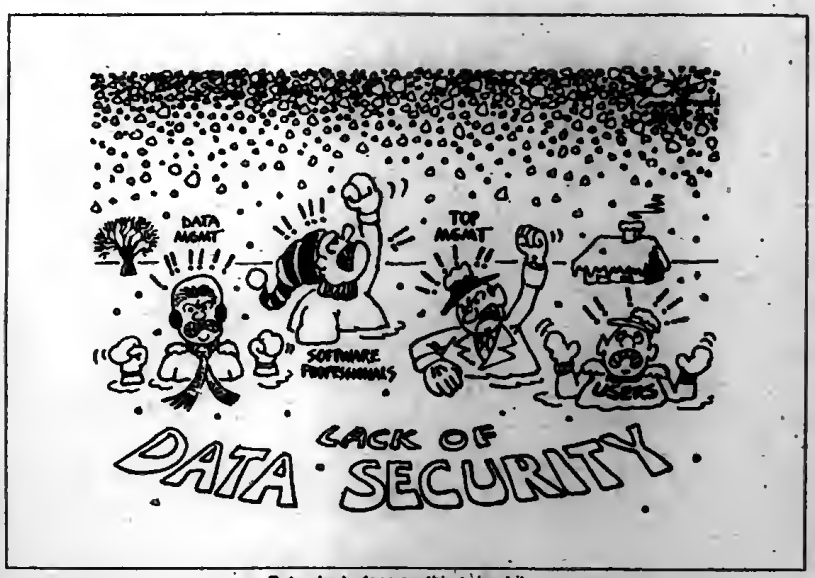
For several reasons, *Computerworld* expects Fujitsu will proceed cautiously while converting the Amdahl organization to a distributor of Japanese products, which eventually it must. Any rapid and blatant strategy to flood the U.S. market with Fujitsu products can only flame the ever-present congressional embers of trade protectionism and lead to legislation that could hurt everyone.

Fujitsu is likely to proceed at a cautious pace with this experiment, retaining the prerogative of pulling out if something goes wrong, and letting market acceptance determine how great its commitment will be.

This is very much an experiment that should not be confused with the American defeat on the earlier fields of consumer electronics. Unlike the American television vendors vanquished by Japanese competition, American computer vendors are truly multinational companies that have the resources and the technology to compete in many markets. What Fujitsu can do here, surely IBM and other major U.S. vendors have the potential to do in Japan and other Asian markets.

Consumers generally benefit from competition; therefore, the U.S. information processing community should be cheering the Fujitsu experiment. Many times over the past year, theories have surfaced that it is only a matter of time before IBM can squeeze the plug-compatible manufacturers out of the marketplace; some say the process is already under way. Fujitsu brings to the U.S. market vast resources and an impressive product line that offers something for every level of performance requirements. Fujitsu is not a limited player that will catch cold every time IBM sneezes.

Another factor to be considered is that the more Fujitsu becomes entangled in the U.S., the more the U.S. becomes entitled to Japanese technology. International trading requires manufacturers to cast off the blinkers of provincialism and answer to another sovereign — the bottom line.



But nobody does anything about it.

LETTER

Outlay of money to save lives should be encouraged

I am concerned by *Computerworld*'s editorial, "The VDT scare: reason to pause" [CW, Feb. 27], regarding health hazards from VDT radiation to unborn babies.

While acknowledging that from an epidemiological standpoint there is no conclusive evidence that VDT radiation is the cause of the danger to unborn babies, I must, nevertheless, object to the conclusion that the editorial arrives at, namely, that without proof of death and disfigurement to babies, nothing should be done to add protection for the VDT user.

The group mentioned in the editorial — 9 to 5, the National Association of Working Women — is not demanding the withdrawal of VDTs and the resultant economic collapse of the nation, but simply a capital expenditure on the part of employers and manufacturers to ensure protection from a possible hazard.

Conclusive proof on this issue at hand may cost lives.

How can this be demanded from VDT users and their families?

Surely if such an outlay of money might be responsible for saving a baby's life or its physical or mental health, then all of us should strongly encourage, even demand, that such an action be taken.

Jill R. Meyer
Bloomington, Ind.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.

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VIEWPOINT

The 'whatchamacallit'



LECHT ON SCIENCE
Charles P. Lecht

Talk about dreams coming true — and happy ones to boot. Before our very eyes, the TV set, the hi-fi, the movie camera, the videocassette recorder, the telephone, the typewriter and the personal computer are fast becoming components of an integrated personal multipurpose thing, which — for lack of a better name — we can call the "whatchamacallit."

Thus, our need to acquire the whatchamacallit's components as discrete consumer items is diminishing; and as our whatchamacallit's capabilities improve, so will our needs diminish for such items as desk calculators, still cameras, voice-recording telephone answering machines, ham radio equipment — all the electronic doodads you can think of.

Other tried-and-true gadgetry are to see immediate obsolescence, as though swept away in a tidal wave of replacement technology; electrical light switches, electric outlets, cable connectors and other such physical devices are disappearing. Amazingly, some artifacts presumed unchangeable without sacrifice of quality, such as orchestral instruments, will undergo sudden change to re-emerge in new forms.

The mixed device-originated/musician-originated sound will improve and enhance the musician's skills and improve new opportunities for artistic education and expression. The whatchamacallit's possibilities for providing positive and enduring change are as endless and beautiful as may be the best of man's.

It's fascinating that as the whatchamacallit is taking shape in microland, mammoth macroland computer/communications systems are being developed. These Integrated Services Digital Networks (ISDN) are impersonal multipurpose things that will nourish and be nourished by our whatchamacallits.

The ISDN suggests the vision of a computer system so large it possesses electronic broadcast and cables "buses" to pipeline data swiftly coast to coast, while servicing massive clusters of systems en route — "transistors," warehouse-size lattices of high-voltage gear and "capacitors" office-building size. These further inspire a vision of America as a giant computer room, with corners in Seattle, Los Angeles, Miami and Boston. Vested in each ISDN may be the power of a billion personal computers.

Offers great promise

While this idea is knee weakening, the knowledge that these awe-inspiring titans will serve to nourish our little personal whatchamacallits — sending them their life's blood, data and converting this into every conceivable use — is beautiful and offers great promise for improving the quality of our lives. Access to the massive external facilities, with their enormous power and memory capacities, allows us to enjoy the powers that computer systems provide as mixtures of that possible within our whatchamacallit's local environment and that found in the ISDNs.

This will enable an optimized functional specificity of the two, while permitting superefficiency at the whatchamacallit. Whether in the home, in an industrial supercomputer cluster or anywhere in between, the variety of user-accessible on-premises equipment (that is, whatchamacallits) to emerge will be as unlimited as the inventive imagination.

For manufacturers, the business opportunities are spectacular. Like massive Christmas trees awaiting adornment, ISDN accoutrements will consume the efforts of engineers and scientists for decades to come. The result will be an endless bounty of customized whatchamacallits, decorated and illuminated by all manner of technological gadgetry, yielding gifts of electronic wonder.

Consider, for example, the possibility of the heretofore unimaginable luxury of a personal videostation, capable of communicating pictures, sound and text anywhere in the world — a personal National Aeronautics and Space Administration-like mission control for the orbit of your life.

Possessing all manner of sensing devices to obtain signals from alarm to video and anything in between, capable of processing these and displaying results in user-friendly media, the terminal of the decades ahead will provide users with creative opportunities of mind-boggling proportions.

The technically inclined will revel in the possibilities this kind of environment allows for tinkering, and the entertainment seeker will have his hedonistic wishes fulfilled and then some.

Imagine having your own personal whatchamacallit, providing such integrated services as may be currently obtained only through the nonintegrated facilities of such mammoth enterprises as AT&T, the Post Office, IBM, a secretarial service, a music/video recording studio and a TV/radio station — all in one room!

Distinctions vanishing

As today's personal computers receive expanded telecommunications capabilities and telephones develop further as microprocessors, distinctions between them are vanishing. Very soon we will call both by the generic name "terminal," thus downplaying their local attributes and stressing their global ISDN roles. Performance and function will qualify this name — fast, slow, data base, graphics and so on. Each will become a whatchamacallit or a component of one.

The benefits to be reaped by a carefully orchestrated plan that weds the needs of home/office whatchamacallit users to ISDN support are immeasurable.

Admittedly, the degree to which this can be achieved will become an important factor in determining which components to buy if we insist on putting it together ourselves.

Remembering the "build-your-own" hi-fi days with chagrined embarrassment, most of us will opt for someone else to integrate separately purchasable components.

The emerging sea of options, while confounding us in one sense, provides us with overriding benefits in another sense. It will allow us to apply better today's ever-expanding data processing power to our needs. The results will profoundly improve how we see, hear and speak to one another. Ultimately, they will change the way we think.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Micro user sets record straight



IRISH CONNECTION
Jack Stone

Because it is impossible to send personal notes to the many respondents to my column, let me here thank you one and all for your thoughtful comments to my recent expressions of concern over the rank idiocy that is plaguing the microcomputer industry.

However, I have selected one letter that clearly deserves a public airing, partly because the reader is a more knowledgeable micro user than I think I am and partly because he is a more capable writer than he thinks he is. The letter was from Richard W. Hadley, vice-president of operations, Mount Auburn Savings Bank in Mount Auburn, Ind.

"I've been enjoying your columns for a number of years, but I can't let a few of your recent statements go unchallenged," Hadley said. "In particular, I take exception to portions of your articles "Confiscatability key to transporting micros overseas" [CW, Jan. 23] and "Where are the knowledgeable micro retailers?" [CW, Jan. 30].

"This letter is being written on an Osborne Computer Corp. Osborne 1 (01). Now I'll be the first to admit that the 01 (or any of the 'transportables') would not be much fun to carry on a 5-mile hike, but 'archaic'? Hardly! What is 'ancient,' 'old-fashioned' or 'hardly used' about a 64K-byte, 4 MHz Zilog, Inc. Z80 system? A large percentage of new systems, including the basic IBM Personal Computer, specs no better."

I admit that new systems are not that much better than the 01, particularly when benefits derived are measured against dollar outlays. And for students of creative writing, like myself, new machines with the so-called advanced word processing software actually offer me reduced capability when compared with my Processor Technology Sol 20/software configuration. My problem is one of semantics. Maybe "archaeological relic" is too strong an expression, but what do you term a way-out-of-production machine that still works for you — a quasi-leading-edge system or a fairly advanced technology-based machine?

> *'Most computer store personnel should spend their spare time reading systems manuals or trade journals rather then playing Zaxxon or watching* Whiz Kids. *But let's not blame them for the absence of standards of compatibility where none exists.'* — Richard W. Hadley, vice-president of operations, Mount Auburn Savings Bank, Mount Auburn, Ind.

"Secondly," Hadley went on to say, "is the 5-in. screen any more ridiculous, particularly for word processing, than the displays on most of the lap portables? That's a matter of opinion at best, but I'd have jumped at the chance to get another 01 for $800."

No, 01's screen and the laps' LCDs are equally ridiculous for word processing, and if the 01 weighed in at 10 lb or less, I'd be first in line with the cash.

"I think you were distinctly unfair to at least one of the retailers you visited," Hadley said. "Most computer store personnel should spend their spare time reading systems manuals or trade journals rather then playing Zaxxon or watching *Whiz Kids*. But let's not blame them for the absence of standards of compatibility where none exists.

"You really didn't expect to be able to use the tapes from a new NEC Information Systems, Inc. lap portable on your Sol 20, did you? Good grief, if you've been using a micro for six years, you know better. We've

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VIEWPOINT

How to motivate systems professionals

READER'S PLATFORM
Robert E. Mintz

Data processing managers should spend more time understanding the efficiency characteristics and potential of their professional staff and attempt to maximize this valuable resource through proper motivation.

Historically, DP managers have not spent nearly as much time attempting to maximize the efficiency of professionals' activities as they have their equipment. In fact, DP managers will spend a great deal of time and effort in attempting to increase the efficiency of their computer equipment by 10%, 5% or even 3%, while spending more money on systems analysts' and programmers' salaries than on equipment.

The attempts that have been made in improving efficiency have been in the areas generally called "human engineering." The engineering approach attempts to find the most specific job content and appropriate incentive system to maximize the efficiency of the human machine. Jobs and tasks are analyzed, and more efficient methods of accomplishing such jobs and tasks, for example, structured programming, result. Actually, the greatest increase in output (quality and quantity) of analysts and programmers is, as for any professional, through motivation.

Equipment vs. personnel

Why would this be? Why would DP managers tend to spend more time analyzing the efficiency of the equipment rather than the efficiency of personnel, even though there are few greater savings to be realized in the latter area?

The answer to this question is not difficult to find. First, motivation is difficult to measure, and equipment efficiency is not. Second, the factors comprising equipment efficiency are easily understood, and those for motivation are not. Most DP managers come from a technical background and feel uncomfortable with and have little inclination for personnel management. The problem lies, then, in the managers, not the employees.

In terms of managing, motivating and maximizing efficiency in systems and programming personnel, there are two distinct problems: first, how to perceive an existing problem; and second, how to motivate personnel on an ongoing basis to achieve maximum efficiency.

In neither case are there hard-and-fast rules or equations to be laid down for use. There are, instead, only general guidelines that may be used in solving the two persistent problems.

The most obvious opportunity for motivational activities to be effective is to solve existing problems. The most difficult portion of this is, in fact, the perception that a problem exists.

Two types of information

In order to understand and to diagnose a problem correctly, there are two types of information available to the DP manager. These fall into the broad categories of structured and unstructured information. The DP manager should organize and routinize as much crucial information as possible so that it comes to him through formal routes, and he can monitor the activities for which he is responsible. Such items as turnover rates, grievances, weekly or periodic status reports and reports of supervisors should normally tell the DP manager when something is amiss.

These pieces of structured information are signal systems set up in advance to warn the manager when problems are about to or have occurred. The greatest practical danger in the systems is total reliance upon the pieces of structured information to the exclusion of other sources. In fact, much information may be gathered outside of the formal organizational structures, and such information is necessary.

The more frequent and more useful type of information is the unstructured. The principal source of unstructured information is the social system of the organization. Off-hand comments, conflicting reports, unexpected news and a general feeling that a problem exists should all point to a potential problem among workers. These will very frequently point to potential or future problems as well as existing problems.

Own frame of reference

The most difficult aspect of understanding the information available to the manager with respect to existing problems is cutting through his own frame of reference. Each person tends to organize available information into his own preexisting views. For the manager to understand properly the organization and the personnel with which he is dealing, he must first have an accurate insight into his own frame of reference.

The errors most frequently made in the area of understanding one's own frame of reference include:

- A tendency to evaluate rather than understand.
- A tendency to equate past experiences with current experiences.
- A tendency to use only available solutions, as opposed to thinking of new solutions.

The above framework should be helpful in assisting a manager in perceiving problems within his own organization. Once a motivational problem has been found and correctly diagnosed, the following guidelines should be useful in maximizing the potential of employees.

For quite some time now behavioral scientists have been distinguishing between negative and positive motivation. Most managers, par-

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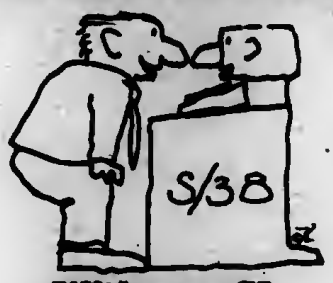
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VIEWPOINT

Implementing the information center concept: One



READER'S PLATFORM
Naomi Karten

Many people still do not agree on whether the information center is a concept, a place, a function or some combination of these. Therefore, it is not surprising that although most information centers have the same basic objective of improving user productivity through user-oriented hardware and software, the manner in which this objective is implemented varies widely.

Awareness of the many variations may be helpful to information center planners, particularly in allaying any concerns about whether they are going about it right.

In some companies, for example, the information center's sole responsibility is training and support of users in the use of fourth-generation languages. In other companies, information center staff also perform product evaluation, selection, acquisition and implementation of end-user products.

Some information centers develop and provide all training themselves. Others call in vendors or professional trainers to provide training in end-user software and/or call upon DP training staff to provide instruction in computer fundamentals.

Some information centers support purchased software only, while others also develop their own software in response to identified user needs. Some information centers depend on other DP areas to perform such tasks as file extracts, data base creation and Job Control Language setup for the information center. Other information centers perform all such terminal work themselves, up to and including the enhancement of supported products with customized user interfaces.

No programming for users

Whether or not they undertake the setup of the information center technical environment, some information centers do not perform programming for users, placing the burden of responsibility on users to learn and use available products.

Other information centers, in addition to providing training, program in response to user's ad hoc requests as a means of supporting management's needs for rapid access to computerized information.

In some companies, personal computers — and the full range of responsibilities that the acquisition and management of personal computers entails — are an integral information center function. In other companies, personal computers are managed as a separate and distinct responsibility, while in others, the decision is made (or not made) to leave the purchase and use of the personal computers to the individual users.

Some information centers that manage personal computers strictly control the personal computer software users may acquire. Others do not place any restrictions on users acquiring the software of their choice, but limit support to only selected software.

In some companies — probably most — the information center is part of the data processing organization, and all members are hired by and responsible to data processing. In other companies, the information center is somewhere between data processing and the user, with representatives from both areas involved.

In spite of the variations, certain common themes emerge: user support, user independence, quick access to information, productivity and decision support all pervade any discussion of the mission of the information center regardless of the specific method of implementation.

These differences in style

VIEWPOINT

approach not necessarily better than another

and approach are exciting because they demonstrate the many ways that companies have chosen to accomplish the same basic objective.

Benefits and risks

To be sure, there are benefits and risks to each of these approaches, as some of the more mature information centers (those in operation two years or longer) are finding out. Consider the technically oriented vs. nontechnically oriented information center staff.

Nontechnically oriented staff are often at the mercy of their technical support areas to keep the technical pieces in place, for example, installation of new product releases, resolution of software bugs, timely creation or update of user data bases. Being nontechnical, and to some extent not conversant in the stuff of technical problems, they can become caught between the demands of their users and the delays (whether valid or not) of their technical support areas. However, as a nontechnical area, this type of information center, by definition, has a ready explanation for not getting caught up in supporting the technical needs of its users and can, therefore, devote full attention to training and support.

The technically oriented information center, on the other hand, usually consists of people with both technical and training skills. The people generally have DP training and/or experience prior to joining the information center, and they want to do technical things. They can solve most technical problems that arise in the use of the supported software, with minimal reliance on other DP areas.

Having the technical skills to solve the data access needs of their users, these people may face the temptation to do so rather than invest the time in training their users — an instance of the "I can do it faster myself" syndrome. Their users, at the same time, quickly become aware that these are technical folks, and the scope of the resulting requests for support tends to extend far beyond that of the nontechnical information center.

One better than other?

Is either approach to the information center better than the other? From my comparisons with managers and staff from other information centers, I would say no.

Both types have problems, but both types have had major successes in providing end users with reduced dependence on application development departments and increased independence in satisfying their data access, manipulation and reporting needs.

Most importantly, perhaps, there does not seem to be anything inherent in any implementation of the information center concept, structure or technology that would prevent an information center from evolving from its current user support methodology to any other methodology. Recognition of the many alternative paths is the key. ‡

Karten is information center manager at Blue Cross Blue Shield of Massachusetts in Boston.



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never had a true tape standard. You're an engineer. If you want to tackle a hardware problem like that, fine, but why blame some poor store clerk who undoubtedly had never heard of a Sol 20?

"You even found one salesman who was willing to try the improbable. That should have been worth a column of praise, not a hatchet job."

Yes, I was an engineer until I found early on that my competency level was so absurdly low that teaching — and writing — was more appropriate. As a result, the prospect of installing public domain software on my Mediterranean-blue-paneled, mahogany-trimmed Sol 20 Professional Computer to support a lap job was so horrendous that I turned to the remote possibility of tape compatibility as a saving feature. I never asked the salesmen to do any more than copy a file from the NEC to the tape machine, using standard NEC commands. This they couldn't do, and even though I thrive on reading technical documentation, NEC's write-up didn't match NEC operations, and I couldn't make the copy, either.

"Your column is being read by a lot of MIS types who have apparently been studiously ignoring microcomputers for the past six or seven years, hoping they would go away. Now they're being dragged, kicking and screaming, into the real world by the users.

"Maybe those of us who have been in the micro vanguard could be of more service to those poor souls by being a little more selective about where we do our complaining. We don't need to give the MIS Luddites any more ammunition than necessary.

"I guess what it boils down to is this: I agree with most of your basic premises, but I think your examples were ill-chosen.

"My final advice? Go back and buy the used Osborne 1. After all, it was designed by the same man that designed your Sol 20. I'll even give you a disk full of communications software so that you can trade data files with your Sol. Then go on to Mexico, and enjoy yourself. You can always tell the customs folks that it's a sewing machine."

Didn't know of the Sol/01 connection. May have to re-evaluate the 01 afterall, particularly if it can thread a bobbin in less than two seconds. ‡

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ticularly those with a technical orientation, are oriented toward negative motivators. These are company policy, administration, supervision, working conditions, salary, relationships within the group and security. These factors are generally called "hygiene factors."

Positive factors

Positive factors are called "motivators." These are achievement, recognition, work content, responsibility, advancement and growth.

An important difference between the two general classifications is that the hygiene factors relate to job dissatisfaction and the motivators relate to job satisfaction. If any of the hygiene factors is not satisfactory to the employee, he will be dissatisfied with his job. However, if they are all satisfactory, it is not the case that he will be content with his job or that he will perform to his maximum potential.

On the other hand, if all of the motivator factors are satisfactory to the employee, he will be satisfied with his job. If they are not, he will perform only the expected or minimum requirements of his job.

The goal of managing professional employees should be to promote their efficiency to the maximum level. The way to do this is to increase their motivation as far as possible. If problems have been recognized in this area, fine; if not, an attempt should be made to maximize motivation in any case, because it would seldom naturally occur.

By distinguishing between the two broad characteristics, it should be recognized that simply meeting salary demands and the like will only keep the person on the job, but will never begin to maximize his efficiency.

A great deal more effort is necessary in achieving the other six general motivators in order to increase the efficiency of the employee. These are more important for professional-level employees because of their background, the nature of their work, the possibilities of meeting those requirements and the salary levels and costs involved.

In trying to maximize the motivators, there are many factors that must be considered. Generally, these come under the label "job enrichment." That is, a job should be designed to have the employee meet each of the six motivators. It should be recognized that motivators should be used for producing long-term effects on employees. By having employees participate in job redesign to increase their satisfaction, only short-term movement will result. Unless the basic natures of the jobs are changed, only a temporary sense of movement will occur.

Some of the most common pitfalls of such redesign include:

- Thinking that the content of a job is fixed.
- Thinking that employee participation is necessary to improve motivation.
- A confusion of the motivators and the hygiene factors.
- Simply increasing the volume of work.
- The belief that once a job is changed, no monitoring or further action is necessary. ‡

Mons is a data processing consultant in Tampa, Fla.



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SOFTLINE
Lee Gilliam

Package solution: buy *and* make

The "make or buy" question of applications software continues to be raised by managers who are short on staff and long on user requests. Quite often, companies with a flexible attitude have been able to acquire packages such as general ledger, payroll, accounts payable and accounts receivable and implement them unchanged.

But more often than not, a package is rejected because it does not provide every feature desired or because it requires some modification or conversion effort to implement.

Because of the ever-increasing demand for applications, coupled with limited development staff size and experience, the question of make or buy must be reconsidered to include the option of "buy and make." In other words, the quickest alternative for meeting a user's needs may be to acquire a package that offers most of the capabilities required and use the in-house staff to customize, supplement and implement the product.

How do you go about determining if there are software products available that could be considered for a unique or industry-specific application? You might want to start with your mainframe vendor representative, who could use channels within the vendor organization to locate such software. Trade publications carry advertisements of vendors and their offerings. Industry conferences and exhibits often include a presentation of papers or demonstration booths informing attendees of software packages. Directories or catalogs are available by mail or even on the newsstand. Consultants can often direct you to qualified products or suppliers. The best source may be the contacts you have in your own industry.

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Shopping for security?

Look for accountability, integrity, auditability

By Vic Swan
Special to CW§

The publicity fire storm over the movie *War Games* and the escapades of real-life hackers have many data processing managers running for cover. But shopping for computer security is no easy task.

The first step in selecting security software is to decide exactly what is to be protected. After defining the specific needs of the company and considering the high cost of even one security loss, it might be helpful to keep the following list of questions handy when approaching a security software vendor.

Is the security by exception or default? The security-by-exception philosophy proposes that if the data is to be protected, you have to identify what is sensitive, take the necessary protective action and define who can access that data. This is the list-oriented philosophy and requires considerable administrative effort to maintain the lists as users come and go.

The default system allows growth without undue administrative overhead. It involves perhaps more preplanning, ... but the time is well spent in the long run.

For fairly small organizations with a homogeneous community of users, exception might be the more viable approach as the initial installment is often comparatively simple.

The default system allows growth without undue administrative overhead. Driven by algorithmic specifications, it involves perhaps more preplanning and more front-end thinking, but the time is well spent in the long run.

Once the default system is implemented, all data is secure unless explicitly designated otherwise. Users are grouped together by the security system, based on a particular category, or a group of categories as the company chooses.

Can the system be bypassed? In some systems, security officers have access to a list of passwords that allows them to gain access to the user's data. The problem is that a user could always point the finger at the security officer if a security exposure occurs. There is no individual accountability in such a system.

In other security systems, security officers do not have access to the users' passwords. If the user loses his password, he cannot gain access until the new password is changed to another password, which the security officer does not know and which is encrypted in storage. No finger pointing can occur in this case.

Even if the security officer attempted to bypass the system by pretending a user lost his password, the user could find out. A good auditing feature is of utmost importance in a default security system.

Can individuals be held accountable for their actions? If a physical list of passwords exists in a list or in a file folder in a storage facility, security is seriously threatened. There would be no way of knowing for certain who gained unauthorized access.

It is important to make sure a system does not flash the password on a user's terminal when the user types it in. One-way encrypted passwords that cannot be decoded and are stored in the software seem to be the most desirable.

Does the operating system offer guaranteed integrity? If so, security by default cannot be bypassed. Security by exception can. Newly created resources may be unprotected simply because no one knows of their existence, and no one has yet found time to protect the "ones they feel need protection."

Does it have auditability? Most systems have an emergency bypass system. The important consideration is to make sure that all uses of the emergency bypass can be audited.

A security officer should not be able to gain access without identifying himself. In an ideal system, auditability must exist on the following levels: individual user, resource, administrative/security officers and the security system itself.

Is data security dependent on Format 1 Data Set Control Block? If the answer is

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Buyers warned of software promotion hype

By Paul Korzeniowski
CW Staff

BOSTON — "When evaluating software this year, *caveat emptor* — let the buyer beware," said Janice Antonellis, research manager at International Data Corp. (IDC), at IDC's 19th Annual Industry Briefing Session, held at the Copley Plaza here recently.

"There is a lot of hype and a great deal of money being paid to create images which may or may not be true. Promises are being made by software manufacturers. Users should realize that many of the interesting programs are not scheduled to be shipped until the fourth quarter of this year," she said.

Fierce competition is forcing software companies to spend large sums of money to promote a product, Antonellis said. Money and marketing are becoming major factors in determining a product's success. "Every company is trying to elevate itself above the clutter, noise and crowd. Mitch Kapor [president of Lotus Development Corp.] said that it took $3 million to market Lotus 1-2-3 last year. He said it would take $5 million today."

To ensure that they can compete, software companies are branching out from traditional markets and into new product areas. "Software companies are diversifying so that they will not be just a one-product shop," Antonellis said. "They are trying to maximize their current customer base and extend their traditional customer base."

Management Science America, Inc. (MSA) has added microcomputer products, productivity tools and data base management systems to its accounting software. Cullinet Software, Inc. has shifted from just selling data base management to developing financial application software as well, she pointed out.

Another method to generate revenue is consolidation and acquisition. Acquisition fever is sweeping the industry as mainframe companies acquire microcomputer companies, microcomputer companies buy microcomputer companies and noncomputer companies purchase computer companies, Antonellis said.

Partnerships allow companies to share costs without relinquishing corporate control. This year, for instance, Lotus teamed up with Dun & Bradstreet Corp., McCormack & Dodge Corp., MSA, Management Decision Systems, Inc. and Digital Equipment Corp. in an effort to distribute 1-2-3.

As the ante is raised, the ultimate winner will be the user. "We are a long way from having truly user-friendly software," Antonellis said. "But user-friendliness will have center stage as long as competition remains keen."

Nixdorf, IBM CPUs get CICS generator

RICHMOND, Va. — Nixdorf Computer Corp. has announced an application development system that it said will generate complete Cobol/CICS applications on IBM and Nixdorf mainframes.

According to a spokesman, Nixdorf's Hibol generates 100% of the code required for Cobol/CICS programs once a user has input simple, structured specifications.

The spokesman also said program debugging time is reduced by as much as 80% because Hibol produces error-free, modular Cobol source code.

Hibol reportedly generates documentation from information extracted from the data dictionary and application programs, screen layouts, reports and data element descriptions.

The system is said to provide Cobol source code portability. Hibol programs in source code can be transported, compiled and executed on any compatible mainframe with or without Hibol.

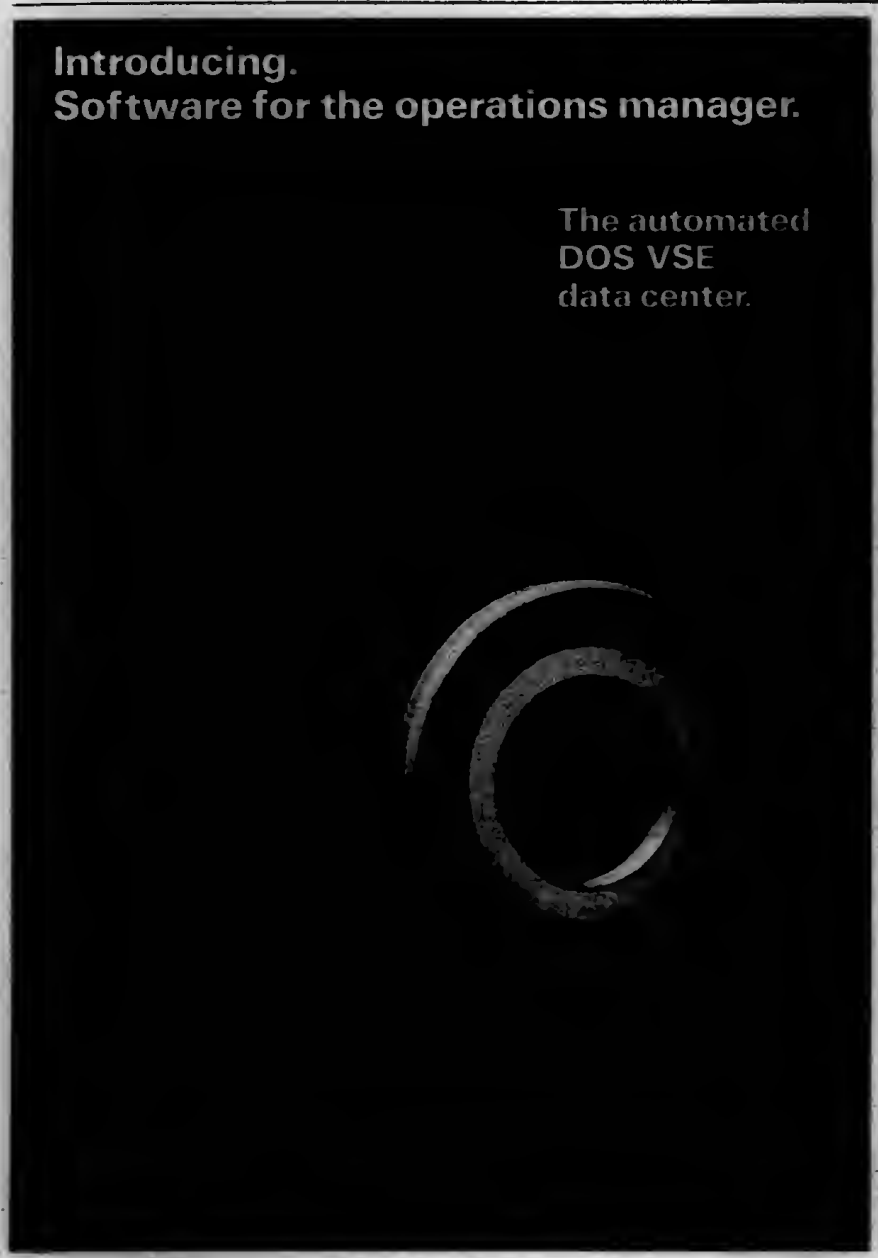
With Hibol, the spokesman said, CICS application menus can be created independently, with no programming involved. The system's menu function generates all code necessary to display the menu and to select the appropriate function.

In an on-line environment, Hibol also allows users to generate or access multiple files or records per screen and can handle multiple screens per program.

Hibol runs under IBM's CICS/VS in DOS/VSE, Edos/VSE and OS operating systems on Nixdorf's 8890 processors, IBM's 370, 4300 series, 30 series and other compatible systems.

A single-license fee for Hibol is priced at $20,000, and 12- or 24-month leasing plans are also available. The 12-month lease costs $870 per month, and the 24-month lease costs $765 per month.

More information is available from Nixdorf at 6517 Everglades Drive, Richmond, Va. 23225.



DEC announces RPG-II language for VAX-11s

MAYNARD, Mass. — Digital Equipment Corp. has announced a new RPG-II language for its VAX-11 series of processors.

The VAX RPG-II language is intended primarily for commercial applications requiring frequent report generation and ongoing file maintenance and for educational institutions training students in business programming, a spokesman said.

A native-mode language running under DEC's VMS operating system, the VAX RPG-II language is integrated into the VAX common language environment. That enables VAX RPG-II programs to call modules written in other VAX-11 languages as well as many VMS runtime library routines and VMS system services, DEC said.

VAX RPG-II also uses the VAX Record Management Service, which is said to provide mutual shared access to files by programs written in VAX RPG-II and other VAX-11 languages. DEC said the new language product consists of a compiler capable of speeds of approximately 3,000 line/min, an editor tailored to the columnar structure of the language and runtime support.

The VAX RPG-II compiler, editor and runtime component are included in the license fee of $3,000. The language is scheduled for delivery in April from DEC, Maynard, Mass. 01754.

File manager from Dylakor fits IBM CPUs

Dylakor, Inc. has announced DYL-280 II, a file and information management package for IBM mainframes.

The product features a full-function report writer, label and letter generation, linear regression capabilities, table and array handling and in-stream Cobol data definition support, the vendor said.

Dylakor's letter writing facility reportedly allows users to combine standard text with variable data from any input file.

Interval selection and random selection can generate test data, select certain records for mailing lists and collect records for data analysis, the vendor said.

Utility commands can retrieve and analyse System Management Facilities records, print in hexadecimal, convert Ascii data to Ebcdic data and retrieve and insert data into DOS communications job regions, the vendor said.

A single-CPU license for DYL-280 II costs $12,200. The system runs under IBM's DOS and OS operating systems.

More information is available from Dylakor at 17418 Chatsworth St., P.O. Box 3010, Granada Hills, Calif. 91344.

More and more, personal computers in large organizations are dramatically improving productivity. But there's also a problem involved with this improvement. People are using many different, often incompatible microcomputers, yet they still need to share information, programs, and peripherals.

It's as if everyone had an automobile, but no highways leading to their destination. No traffic signs to follow. No rules of the road. The result? Mass confusion.

Until now, that is. Until Liaison from SofTech Microsystems.

Based on the p-System,™ Liaison is a family of network software products that lets you establish a workable, efficient personal computer network. It allows personal computers and users to co-operate and work together so that your organization is altogether more effective. Liaison includes systems software products, such as an operating system, print servers and disk servers as well as development tools, including Insight Window Designer,™ a complete "window" development environment. And, a collection of network applications, including a database management package, electronic mail, and more.

Liaison lets you unite many different personal computers in an effective network. 8 and 16-bit machines from virtually all personal computer manufacturers (including IBM,® TI,® Corvus,® Apple,® and Sage™) can all share programs, all work together, all co-operate.

So if you're tired of your different personal computers driving you to the brink of insanity, give us a call at SofTech Microsystems.

We'll show you how Liaison can get you back on the road to recovery.

SOFTECH MICROSYSTEMS

SofTech Microsystems, Inc.
16885 West Bernardo Drive • San Diego, CA 92127 • (619) 451-1230

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Introducing Liaison.™ Software that allows personal computers to co-operate.



The freedom some birds have to migrate is remarkably similar to the freedom you have with software for the System 8000.



Moving your application program with Zilog's System 8000 may be as easy as the migration of

...ems free you ...nts of

Zilog's high performance, multi-user, UNIX*-based System 8000 supermicros give you a proven way to quickly port your minicomputer software onto affordable micros. For instance, we offer compatible migration tools for Basic Four BB III, DEC* DIBOL* and DG ICOB* COBOL

GSA sch... ment ap... Fo... Systems ... Or write ... Corporate ... Avenue, ... C...





SOFTWARE & SERVICES

SYSTEMS SOFTWARE

SYSTEM SUPPORT SOFTWARE, INC.
Quikjob III Release 13.0

System Support Software, Inc. (SSS) has introduced a new version of its Quikjob III featuring native IBM Vsam support.

Quikjob verbs included in the release reportedly provide access to all three types of Vsam data sets. Vsam random access, sequential access and updating are all accomplished without coding subroutines, the vendor said.

Also included is a program that will print a hard-copy screen image of a Basic Mapping System map and the map name from the assembled object code.

Quikjob was designed to run on all IBM mainframes and operating systems. Release 13.0 will be distributed free to all current Quikjob III users. It is priced at $5,445 or can be leased for $125/mo, a spokesman said.

SSS, 5330 Springboro Pike, Dayton, Ohio 45439.

DELPHI DATA SYSTEMS, INC.
DD-Project

Delphi Data Systems, Inc. has introduced DD-Project, a project scheduling system that operates on IBM mainframe computers running under CICS.

According to the vendor, the system can be used to identify project schedule and staff capacity problems through both detail and exception reporting. The information provided by the system can be selected by the user, providing as much or as little detail as desired.

The perpetual lease price of the system is $4,000. A yearly and monthly lease plan, training and system maintenance are also available.

Delphi Data Systems, 9905 Hamilton Road, Eden Prairie, Minn. 55344.

HAWKEYE INFORMATION SYSTEMS, INC.
Pathfinder/38

Hawkeye Information Systems, Inc. has announced Pathfinder/38, software for the IBM System/38 that provides interactive or batch analysis of objects.

The vendor said the first module points out objects that can be deleted, while the second module points out duplicate logical views.

Pathfinder/38 is a menu-driven, command-driven documentation system that provides job stream explosions. It shows all control transfers from one program to another and supports all IBM commands.

The one-time license fee is $1,400. Users are supplied with documentation.

Hawkeye Information Systems, Suite 103, 14358 Delano, Van Nuys, Calif. 91401.

COMPUWARE CORP.
Abend-AID/CICS

Compuware Corp. has announced Abend-AID/CICS, a software product for the IBM OS/CICS environment that analyzes the cause of CICS transaction abends and provides the programmer with on-line diagnostics.

The software can be used in both test and production regions. Transaction abends will be diagnosed in each region, allowing programmers to resolve problems on-line, the vendor said. Prices for the software range from $5,500 to $13,000.

Compuware, 32100 Telegraph, Birmingham, Mich. 48010.

BOOLE & BABBAGE, INC.
IMF/MSS; IMF/SM

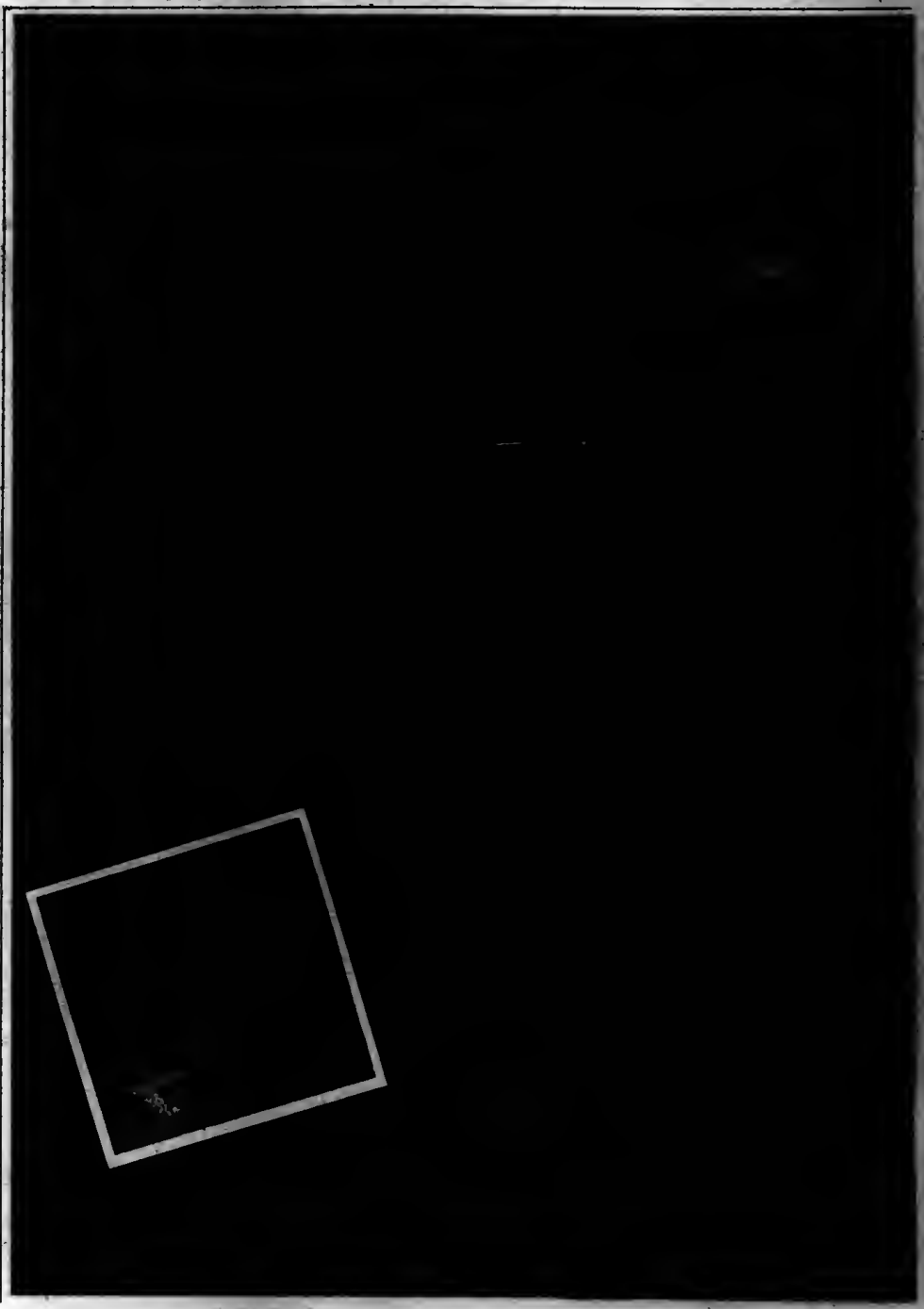
Boole & Babbage, Inc. has announced the addition of IMF/Multiple Systems Support (IMF/MSS) to its IMS Management Facilities (IMF).

IMF software, according to a spokesman, provides performance monitoring and management for IBM's IMS data base management system under IBM's MVS operating system.

With IMF/MSS, the spokesman said, users can diagnose problems and manage performance and operation of a distributed IMS network from a single location. Multiple MVS systems, even if geographically dispersed, reportedly can be managed from a single IMF terminal session.

The IMF/System Manager (IMF/SM) is an on-line program designed to improve

Continued on page 94



SOFTWARE & SERVICES

Continued from page 63

IMS service. Using scrollable panel displays, IMF/SM is said to offer IMS master terminal operators capabilities that are similar to those that IBM's SPF provides for IBM TSO users.

The spokesman said IMF/SM can automatically start, stop or reassign IMS resources.

IMF/MSS licenses for $23,000, and IMF/SM licenses for $28,500.

Boole & Babbage, World Headquarters, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

PRODUCTIVITY AIDS

DATA GENERAL CORP.
SGU enhancement

Data General Corp. has enhanced its Screen Generator Utility (SGU) to interface with five additional languages: APL, C, Fortran 77, Pascal and PL/I.

The user interface for the SGU is the same for all supported languages and protocols, a spokeswoman said. SGU's built-in features include function-key entry, on-line Help facility and default responses for most SGU questions. It runs on DG's Eclipse information system with AOS or AOS/VS and on DG's Desktop Generation series with AOS/VS. The user interface is identical under all operating systems, the vendor said.

Initial license fee for SGU under AOS/VS is $3,000. The fee is $1,500 under AOS; $800 for an upgrade from AOS.

DG, 4400 Computer Drive, Westboro, Mass. 01581.

PERTEC COMPUTER CORP.
System Builder enhancement

Pertec Computer Corp. has announced that it will bundle an enhanced version of its System Builder application generator with current models of its Sabre line of processors under Pick & Associates, Inc.'s Pick operating system.

The enhanced System Builder is said to be completely menu driven and allows users with no programming experience to develop, customize and document applications, the vendor said.

The enhanced version of System Builder is only available as part of the software bundled with the firm's line of Sabre computers. Prices for computers within the Sabre line begin at $9,500.

Pertec Computer, 17112 Armstrong Ave., Irvine, Calif. 92713.

CINCOM SYSTEMS, INC.
Scenario

Cincom Systems, Inc. has released a step-by-step programming aid for application prototyping as an optional feature of Mantis, its fourth-generation application development system.

With Scenario, a user reportedly can define the system flow during the design phase of an application and see the hierarchy of the screen-to-screen flow within the application. Users can then demonstrate the defined scenario as if the application had been implemented, a spokesman said. Scenario can also be used to transform a completed design into a production application.

An optional feature to Mantis Release 3.7, Scenario is priced at a single-use charge of $7,500. The annual renewal charge is $975; a one-year monthly license charge is $312, and the installation charge is $750.

Cincom, 2300 Montana Ave., Cincinnati, Ohio 45211.

APPLICATION PACKAGES

COLLIER-JACKSON, INC.
CJ/Personnel

Collier-Jackson, Inc. has announced that its CJ/Personnel personnel processing and reporting package is now available for use with Digital Equipment Corp.'s VAX-11 series of 32-bit minicomputers.

The system is a data-base-oriented, on-line, menu-driven package. CJ/Personnel features application listings, employee status notices, attendance benefit statements, federal Occupational Safety and Health Administration and Equal Employment Opportunity reports and employee transfer reports.

CJ/Personnel is licensed for $24,000.

Collier-Jackson, 3709 Jetton Ave., Tampa, Fla. 33629.

THE MEGA GROUP, INC.
Megagraph

The Mega Group, Inc. has announced Megagraph, a graphing system designed for IBM mainframe users in the MVS/TSO and VM/CMS operating environments.

The mainframe graphing system is interactive with Megacalc, the company's electronic spreadsheet. The system allows users to picture or print all data created with Megacalc in full color. Using Megagraph, all Megacalc data can be graphed into eight types of graphs, the vendor said.

Prices range from $2,500 to $4,000.

The Mega Group, 17701 Mitchell Ave. N., Irvine, Calif. 92714.

WILSON GROUP, INC.
Customer System Product

Wilson Group, Inc. has announced a software package that reportedly enables utility companies to automate customer records using an IBM 4341 computer.

Is your office operating at a crawl...



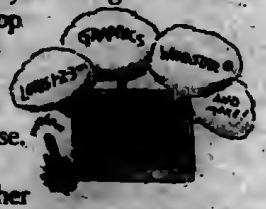
Maybe the one thing you need to get off the ground is the Touchscreen Personal Computer. The HEWLETT-PACKARD 150. Because it's no ordinary machine. Remember the first time you approached a personal computer? If it wasn't exactly love at first sight, it was probably because a lot of machines can be pretty intimidating. Especially for first-time users.



We've made the Touchscreen Personal Computer so easy to use that people like to use it. Very simply, we've taken out the intimidation factor. We've made the new Touchscreen Personal Computer so easy to operate that even first-time users can use it. Which means they'll quickly grow to love it.



For example, to select the software you want to use, just touch the screen. So whether you want to work with words, numbers or graphics, all you have to do to get started, is touch the screen. And once you get going, you can change a number in a spreadsheet, or make a chart for a presentation just by touching the screen. No complicated commands to remember. No desktop gadgets to manipulate. All that's required is the touch of your finger. MultiPlan,™ Graphics, WordStar,® Lotus 1-2-3,™ dBase II,™ VisiCalc® and a world of popular software become easier than ever to use.



The Touchscreen Personal Computer not only communicates with people. It communicates with other computers, too. Your people are your most valuable asset. But the more information they have at their fingertips, the more valuable they become. The Touchscreen Personal Computer delivers again.

SOFTWARE & SERVICES

Called the Customer System Product, the software was developed by the Iowa Public Service Co. The software reportedly supports customer service functions such as service meter installation and reading, customer information, order entry, billing, deposits, credit, collection, customer accounting, revenue accounting and service calls.

The package can be purchased for $240,000 and is available now.

Wilson Group, 333 N. Michigan Ave., Chicago, Ill. 60601,

COMPUTER RESOURCES, INC.
Projectalert modules

Computer Resources, Inc. (CRI) has added six modules to Projectalert, a menu-driven project management system that runs on Hewlett-Packard Co. HP 3000 systems.

Cost and Labor Tracking ($5,000) provides an interactive system that tracks project costs and hours against budgets, the vendor said. Alert Problem Reports ($3,000) produces exception reports that list costs or schedules which vary from original estimates. Resource Leveling ($3,000) reportedly optimizes project resource requirements and eliminates unmanageable variations in work force utilization. Micro Scheduling ($3,000) produces schedules in hourly increments. Report Organizer ($2,000) groups and produces a large number of reports, the vendor said. Activity On-Node ($2,000) allows data to be tied into a network, according to the vendor.

CRI, 5333 Betsy Ross Drive, Santa Clara, Calif. 95054.

SYSTEM SOFTWARE ASSOCIATES, INC.
BPCS Distribution

System Software Associates, Inc. has announced that its distribution application software is available for IBM System/38 computers.

Business Planning and Control System (BPCS) Distribution is one of five packages in the vendor's BPCS. The package reportedly contains features to handle multiple locations within multiple warehouses, contract and discount pricing, credit analysis, multiple companies and profit centers, taxes and sales analysis. Modules include inventory management, customer order processing, billing, sales analysis and purchasing, a spokesman said.

The program is written in RPG-III and is priced at $30,000, including source code and documentation.

System Software Associates, Suite 3630, 200 W. Madison, Chicago, Ill. 60606.

DATA BASE MANAGEMENT SERVICES

TRANSTIME TECHNOLOGIES CORP.
Datamat

Transtime Technologies Corp. has introduced Datamat, a dictionary-driven, multiuser, integrated relational data base management system.

Datamat includes bar charts and scatter plots, math functions, statistics, forms generation and text processing with a built-in interface for other word processors.

Datamat is available on a variety of operating systems and processors, including Unix; IBM's PC-DOS; Microsoft, Inc.'s MS-DOS; Zenith Data Systems Corp.'s Z-DOS; Digital Research, Inc.'s CP/M and MP/M; and Digital Equipment Corp.'s RSX and VMS. It is offered on 56K bytes of random-access memory (RAM) using Zilog, Inc.'s Z80 and Z80A microprocessor or Intel Corp.'s 8080 and 8085; Datamat is also available on 128K bytes of RAM using Intel 8086 or 8088, Motorola, Inc. 68000 and DEC PDP-11 and VAX-11 processors.

The price for Datamat ranges from $200 to $1,000.

Transtime Technologies, 797 Sheridan Drive, Tonawanda, N.Y. 14150.

WANG LABORATORIES, INC.
VS Task

Wang Laboratories, Inc., in cooperation with Cincom Systems, Inc., has announced VS Task, an interactive query and report facility for use with Cincom's Total Version 2 data base management system on Wang VS system products.

The on-line query facility reportedly provides a direct method of retrieving and reporting on information stored in Wang Total data base files. VS Task consists of a query module, through which information is retrieved, and a directory maintenance module.

Other features include a nonprocedural language, English-like syntax and on-line Help messages. VS Task requires a minimum of 256K bytes of memory and about 800K bytes of disk space. It is priced at $10,000.

Wang, 1 Industrial Ave., Lowell, Mass. 01851.

REMOTE COMPUTING SERVICES

MONCHIK-WEBER CORP.
Quote Service

Monchik-Weber Corp. has introduced a real-time pricing service called Quote Service for common stocks, stock options, debt options, index options, financial futures, commodities futures and currency futures and options.

Quote Service is available on the Tymnet, Inc. data base system to micro users with modems for $250/mo, plus $20/hour connect time. It may

Continued on page 86

when it could be flying?



communication

The HP 150 is fully compatible with the big HP 3000 computers and, with the addition of our new 3278 communications capability, the 150 can talk to IBM® mainframes as well. Your people can call up data, work with it and send it back to the host computer. All this with the use of the keyboard. The HP 150 can also send electronic mail and operate a range of peripherals at workstations. Needless to say, this can really move things along. The Touchscreen Personal Computer is a Hewlett-Packard product. This, after all, could be the most important thing you need to know about it. Your professional reputation depends on the key decisions you make. Office automation is one of those decisions. You need to know and trust the company you go with. Hewlett-Packard's long-standing reputation for excellence is a given in the industry. And our service and support will make sure you aren't standing still when you should be flying. See the HP 150 at your local dealer or for information call (800) FOR-HPPC today. Find out how a personal computer with a sense of touch makes a lot of sense for your office.



TRUST

HP 150 at a Glance	
User Memory:	256K-640K bytes
Operating System:	MS-DOS 2.0
Microprocessor:	16-bit, 8086, 8MHz
Permanent Memory:	(ROM) 160K bytes
Diagnostics:	Power-on self testing
Display Screen:	Touch-activated, green phosphor 80 characters x 27 lines 9 x 14 character matrix Upper and lower case Simultaneous text and graphics capability 390v x 512h graphics resolution 1024 characters and symbols in ROM
Keyboard:	107 keys, 8-ft. cord attaches to system unit. 10-key numeric pad, 12 function keys (8 screen labeled)
Compact Size:	2.1 sq. ft. desk space
Communications:	2 RS-232 ports (Built-in) HP-IB (IEEE-488) (Built-in) IBM 3278 (SDLC, BSC). Up to 19,200 bits per second
Peripherals:	Choice of printers (including optional internal printer), plotters, 5.5" and 3½" floppy drives (364KB formatted), Winchester hard discs (5 and 15 MB)
Suggested Retail Price:	$5,995.00

MultiPlan is a trademark of MicroSoft Inc. WordStar is a U.S. registered trademark of MicroPro. Lotus 1-2-3 is a trademark of Lotus Development Corp. dBase II is a trademark of Ashton-Tate. VisiCalc is a U.S. registered trademark of VisiCorp. IBM is a registered trademark of International Business Machines Inc.

PG03408 3021N

Setting you free.
Hewlett-Packard Personal Computers

HEWLETT PACKARD

Continued from page 65
also be accessed for $290/mo from Monchik-Weber customers already leasing the firm's terminal, screen and printer package. That package leases for $500/mo.

Monchik-Weber, 11 Broadway, New York, N.Y. 10004.

ON-LINE DATA BASES

MEAD DATA CENTRAL, INC.
Electronic Clipping Service

Mead Data Central, Inc. has announced a series of additions to its information retrieval systems and a new pricing option for the on-line information services.

Electronic Clipping Service (Eclipse) is designed for use with Mead's computer-assisted retrieval services, which include Lexis and Nexis. The service allows users to track areas of interest automatically on a daily, weekly or monthly basis.

Eclipse search results can be printed in formats ranging from only the relevant portion of an article to the full text of documents, a spokesman said.

The reports contain all the information added since the last report, and users can request a printout of every document in the data base that fulfills their search. The service is priced at $216/mo for daily reports, $54/mo for weekly reports and $18/mo for monthly reports.

Mead also announced that, beginning midyear, *Time, Fortune, Sports Illustrated, Money, Discover, People* and *Life* magazines will be available on its Nexis service. Past issues of these publications will be added gradually, the spokesman said.

Mead Data also announced a new pricing plan for Lexis and Nexis that will be available to private sector subscribers between April 1 and June 1.

The spokesman said the price of each search will be based on the value and amount of information in the file or group of files accessed.

Prices will range from $9 to $18 per search during peak hours, and a 50% discount will be available during off-peak hours. Searches can also be modified for $3 or $1.50 during off-peak hours.

Connect charges for reading, scanning and printing on-line have been reduced to $20/hour plus telecommunications costs, which are typically $8/hour. Off-line printing on high-speed printers leased to subscribers will be 2 cent/line as of June 1.

Mead Data Central, 9393 Springboro Pike, P.O. Box 933, Dayton, Ohio 45401.

MONCHIK-WEBER CORP.
Ticker III

Monchik-Weber Corp. has introduced a service which reportedly provides real-time market information consisting of prices and statistics from over 30 exchanges as well as fundamental and historical information.

Called Ticker III, the service is designed for brokerage firms, money managers, banks and insurance companies, the vendor said.

The cost to lease the service for in-house use is $40 per accessing device with a minimum charge of $2,400/mo per account.

Monchik-Weber, 11 Broadway, New York, N.Y. 10004.

TRAINING

MVC ASSOCIATES, INC.
Focus Reporting for the End User

MVC Associates, Inc. has announced an addition to its line of interactive computer-based training (CBT) courses.

"Focus Reporting for the End User" contains between six and 10 hours of basic training for users of Information Builders, Inc.'s Focus fourth-generation language.

The course uses IBM's Interactive Instructional System and is also compatible with Goal Systems International, Inc.'s Phoenix system. The CBT costs $4,500 and can be leased for $175/mo.

MVC Associates, 849 N. Summit Ave., Lake Forest, Ill. 60045.

SECURITY from page 59

yes, security can easily be compromised because the record defines a file to the system with one bit that states whether the data set is protected or unprotected. If that bit, accidentally or otherwise, gets turned off, all protection is lost.

If the system should fail, will it fail without incident? Default systems do. Other systems that operate with exception protection may not.

Is there a transitional capacity for gradual implementation of the security system? This feature is most helpful at initial implementation.

Was the product initially designed for security by default? If a company's security software decision leans toward the default system, it would be wise to determine if it was designed that way or if it has been "patched" to the default system.

Are there users who can be contacted about the product? This could be the most important question and can yield valuable information. Another user might find it difficult to relate one specific application to a different kind of application, but could provide enlightenment regarding ease of use, installation, support systems and other information.

Swan is marketing manager for Cambridge Systems, Inc., which markets the ACF2 algorithmic security product developed by SKK, Inc.



FALCON
on-line data entry that's above and beyond the ordinary

For an easy-to-use, completely interactive data entry system that's designed especially for the end user, you need FALCON.

FALCON operates standalone or as a task under CICS and the other major TP monitors giving you total flexibility and performance. It supports both DOS and OS operating systems to provide versatility and upgrading capabilities. And FALCON automatically converts VIDEO/370 formats.

FALCON's high-level security system protects your data against unauthorized access. It lets you decide which operators can use specific functions. And with FALCON you never worry about losing data. If the system fails, all data is recovered. If a terminal breaks down, just go to another terminal, rescue your data, and start working – right where you left off.

FALCON's on-line instructions help you design screen formats, enter and verify data, maintain files, create tables, and submit your own jobs. Just touch a key, tell FALCON what you want to do, and the instructions appear right on the screen.

With FALCON, you can make decisions based on the productivity of your operators without leaving your office. You can monitor the progress of all active terminals and view job accounting statistics on-line.

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For more information contact
Phoenix Computer Corporation,
11949 Jefferson Boulevard,
Culver City,
California 90230.
Toll free (800) 255-5049 or
(213) 827-4500 in California.

FALCON



PACKAGES from page 59

If one or more software packages are found that appear to be candidates, you should investigate a number of related factors (see checklist below).

The buyer of application software should always go in with his eyes open. Who is the vendor or supplier, and how important is his reputation, experience, financial status, support policies, staff size and continued existence? Does the proposal explicitly describe the product and services to be provided, cost of the product, cost of modification or enhancement services, delivery dates, training to be provided and the documentation that will be supplied? In some cases, a small vendor may ask for some up-front money as partial payment to finance the completion of a product. In exchange, you may be offered a royalty on future sales of the product. There is certainly room for negotiation here, but do not be diverted from the main goal of satisfying your own client first.

Additional items should be formalized in any software contract. For example, does it include penalties for late delivery, definitions of acceptance and future support services and a commitment to maintain compatibility with future versions of the operating system or hardware? Are you allowed to use the package on any computer in your company or just one specific system? If the latter is true, what will be the charge for additional copies to use on other machines? Will there be a royalty payable to you if other sales of the package are made? Are you allowed to market the package or a revised version of it? If so, what financial and support arrangements are documented in the contract? A couple of areas sometimes overlooked are the payment schedule and reimbursement for expenses.

An understanding should be reached before the contract is signed regarding implementation steps, the time schedule and each party's responsibilities. Must you furnish computer time, office space and so on for the completion of development and the conversion, or will all this work be done on the vendor's system? If there is a choice, what are the costs of each alternative? You might want to install remote terminal equipment in the supplier's offices for access to your system. Also, what other resources, such as people and test data, must be provided? Finally, clearly defining the testing procedures and what constitutes acceptance are of utmost importance.

Of course, there are many other details involved in the buy-and-make consideration than can be discussed here. I would encourage you to be free from the "not invented here" syndrome. Do not expect perfection, but demand quality products and professional services. Your primary focus should be on your user's needs and the time and cost of meeting these needs. If by buying and tailoring a software package you are able to satisfy your user in a more timely and/or economic manner, you can take pride in your accomplishments.

Gilliam is an independent consultant based in Ponca City, Okla. He is a regular contributor to Softline.

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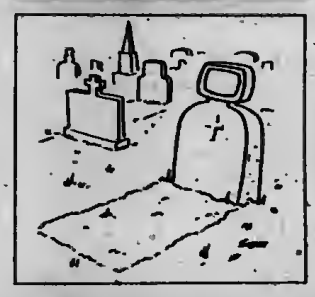
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COMMUNICATIONS

Capital to get downtown teleport

WASHINGTON, D.C. — The world's first downtown satellite communications teleport, which will provide direct access to both U.S. and Canadian satellites, is scheduled for completion by midsummer.

The satellite communications complex, called The National Teleport, will be built on top of the National Press Building in the heart of the nation's capital, a spokesman said.

It is intended to be used by domestic and international broadcasters, news organizations, corporations, associations and government agencies as an alternative to the telephone network for intercity transmission of video, voice and data, according to the spokesman.

The National Teleport is a partnership of National Teleport, a wholly owned subsidiary of Videostar Connections of Atlanta, and Microwave Express, a wholly owned subsidiary of Pyramid Video, located here.

Other teleports being constructed are situated in outlying suburban areas to avoid interference with other communications technologies.

The downtown location is made possible because the teleport will use Ku-band frequencies, which are not used in terrestrial communications, thus enabling the teleport to operate in even microwave-congested metropolitan areas, according to a spokesman.

Initial plans call for installation of two 5-meter Ku-band transmit/receive earth stations.

The earth stations will be connected with multiple fiber-optic cables, coaxial cables and microwave links to locations throughout the greater Washington, D.C., area, according to the spokesman.

There will be expansion space for as many as six additional earth stations, the spokesman said.

Matrix switch integrates net monitoring, management

NORWALK, Conn. — Data Switch Corp. has announced a matrix switch that has integrated network performance monitoring and management reporting capabilities. This eliminates the need for separate systems for these functions, the vender said.

Designed and developed by Data Switch's subsidiary, Intellinet Corp., the Intelli-MAX enables users to monitor the performance of their networks and use the device to switch out bad components or lines.

A feature unique to the system, the vendor noted, is Dynamic Rotational Monitoring. This enables the user to monitor critical portions of his network continuously while monitoring less crucial lines on a rotational basis at user-defined intervals.

Up to seven layers

Network management features reportedly include graphic display of up to seven layers of network activity and information on specific communications applications.

The condition of the network is displayed using a color-coded system in which, for example, red would tell of a line failure, incomplete transaction or control unit failure.

Gradual network degradation can be monitored and flagged when it reaches a threshold specified by the user. Intelli-MAX displays network activity minute by minute and in five-minute color trends, the vender said.

Once a failure or degrading condition has been identified, the matrix switch allows instant reconfiguration of the network via simple commands from the monitor terminal.

Intelli-MAX supports from 16 to 512 lines. The unit costs $61,400 in a fully configured system and will be available in the fourth quarter of 1984, Data Switch said from 444 Westport Ave., Norwalk, Conn. 06851.

Bell Atlantic to offer two local nets

PHILADELPHIA — Bell Atlantic announced plans here late last month to offer two local-area networks. One is the Pronet, virtually a carbon copy of IBM's much discussed but as yet unreleased token ring. The other is the Datakit virtual circuit system (Datakit VCS), manufactured by AT&T Technologies, Inc., formerly Western Electric.

Pronet is manufactured by Proteon, Inc. of Waltham, Mass. It is said to operate at a speed of 10M bit/sec between host interfaces.

The Datakit system was reportedly designed for applications involving lower transmission speeds, more users and bursty messages rather than lengthy messages.

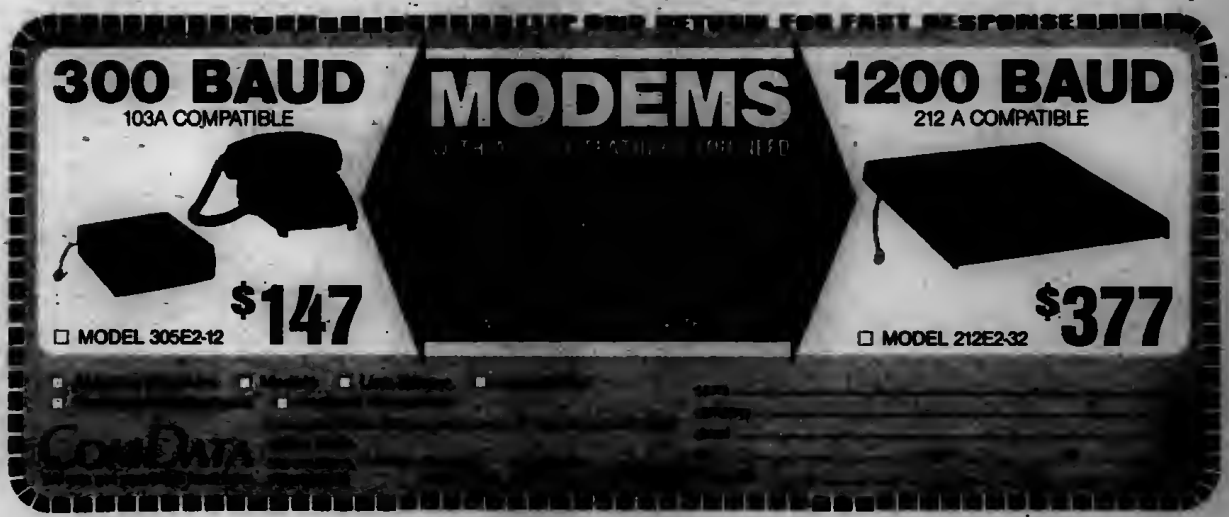
Bell Atlantic said it had signed letters of intent with Proteon and AT&T Technologies covering the marketing of the two products.

They will be offered by Bell Atlanticom Systems, Bell Atlantic's nonregulated, separate subsidiary.

Bell Atlantic is one of the seven regional holding companies established in the wake of AT&T's divestiture on Jan. 1. The company encompasses four divested Bell operating companies — Chesapeake and Potomac, New Jersey Bell, Diamond State Bell (Delaware) and Bell of Pennsylvania.

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MCI plans to expand Cablephone system

WASHINGTON, D.C. — Cablephone, an "alternative local transmission system" developed by MCI Communications Corp., may be installed in as many as eight more cities during the coming year, said MCI Senior Vice-President Brian Thompson last week. "It all depends on the FCC and local telephone companies."

Cablephone systems are now operating in five locations — Omaha, Atlanta, Fort Lauderdale, Fla., Anaheim, Calif., and Rye Brook, N. Y. All of the users are business firms, Thompson said. Although they pay the same rate for Cablephone access that they would for conventional access via telephone-company-provided analog local loops, they obtain much better quality service. "Cablephone conversations are as good as, and possibly better than, what the local telephone company provides," he contended, adding that this is because MCI controls both ends of the local loop — something it can't do when telephone company facilities are used.

Another user benefit of the new system is that service usually can be acquired in far less time. In one case, Thompson said, MCI supplied a customer with several voice-grade circuits within a month after receiving a request for a quotation; the local phone company, he added, was unable to deliver in less than 18 months.

It costs MCI less to use CATV channels to provide service than telephone company local loops, and after April 2, when access charges are scheduled to increase considerably, the savings will be "far greater," Thompson said.

But Cablephone is not a panacea. For one thing, the system can be installed only in those cities which have institutional two-way CATV systems. It will be "several years" before these facilities are deployed in most cities, Thompson pointed out.

"Cablephone is only one of a number of alternative local distribution methods we are exercising," he explained. Others include Digital Termination Systems (DTS) and cellular radio. At the moment, Cablephone seems to be the most useful alternative, Thompson said, because it can be deployed in a limited number of cities at a favorable cost. DTS is more expensive, but "we expect the technology will become considerably more cost-effective during the next three to five years."

Ultimately, the future of Cablephone and the other alternative local distribution systems will depend on the FCC, Thompson added. "The higher the rate for local business service, the more attractive these alternatives become. Recently, the commission rejected one set of tariffs filed by the local carriers, which proposed increases of up to 300% in rates for leased lines connected to long-distance networks. It will be interesting to see what the revised rates look like and how the commission responds to them," he said.



Interface links Apollo Domain to IBM systems

AUSTIN, Texas — Auscom, Inc. has announced an interface to link an Apollo Domain network directly to an IBM or plug-compatible mainframe.

The Model 9011A Programmable Channel Interface connects directly to the block multiplexer, byte multiplexer or selector channel of an IBM or compatible mainframe, and emulates a standard control unit in the host architecture, the vendor said.

After data is received from the host at channel speeds, a direct memory access (DMA) interface in the 9011A completes the data transfer to a Multibus/DR11W DMA card in the Apollo. This DMA card is made by Ikon Corp., Seattle, Washington. Drivers for the Auscom and Ikon DMA cards are available from Auscom and Apollo, respectively. The specification for the data protocol is available through Auscom.

All Apollo Domain nodes can have access to IBM mainframes and plug-compatibles through the interface unit, a spokesman said. Prices range from $16,000 to $21,000. The software license for the 9011A to support the interface is $1,000.

Auscom is based at Suite 102, 2007 Kramer Lane, Austin, Texas 78758.



COMMUNICATIONS

CONTROLLERS

INNOVATIVE ELECTRONICS, INC.
MC-80/800-1

Innovative Electronics, Inc. has announced a communications controller that emulates the IBM 3274-51C controller and enables the use of Digital Equipment Corp. VT100 or compatible terminals in the place of IBM 3277-1, 3277-2, 3278-1 or 3278-2 terminals for communications with IBM host systems.

According to the company, full-screen mapping is performed by the MC-80/800-1, and data displayed on the asynchronous Ascii terminals will be the same as an IBM 3277/3278 display station, with virtual screen sizes of 480, 960 and 1,920 characters. Status information is displayed in English at the bottom of the screen.

The stand-alone, self-powered controller has up to 16K bytes of read-only memory and 16K bytes of random-access memory and can support two dumb terminals for $1,495. Additional ports can be added two at a time for $200.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

ADVANCED COMPUTER TECHNIQUES CORP.
Network Processor

Advanced Computer Techniques Corp. has announced support for IBM and plug-compatible 3270-type display stations, printers and personal computers using its Network Processor (NP).

According to the vendor, the NP can be used in remote concentration, message switching and front-end processor applications. The NP provides access to multiple hosts from the same terminal.

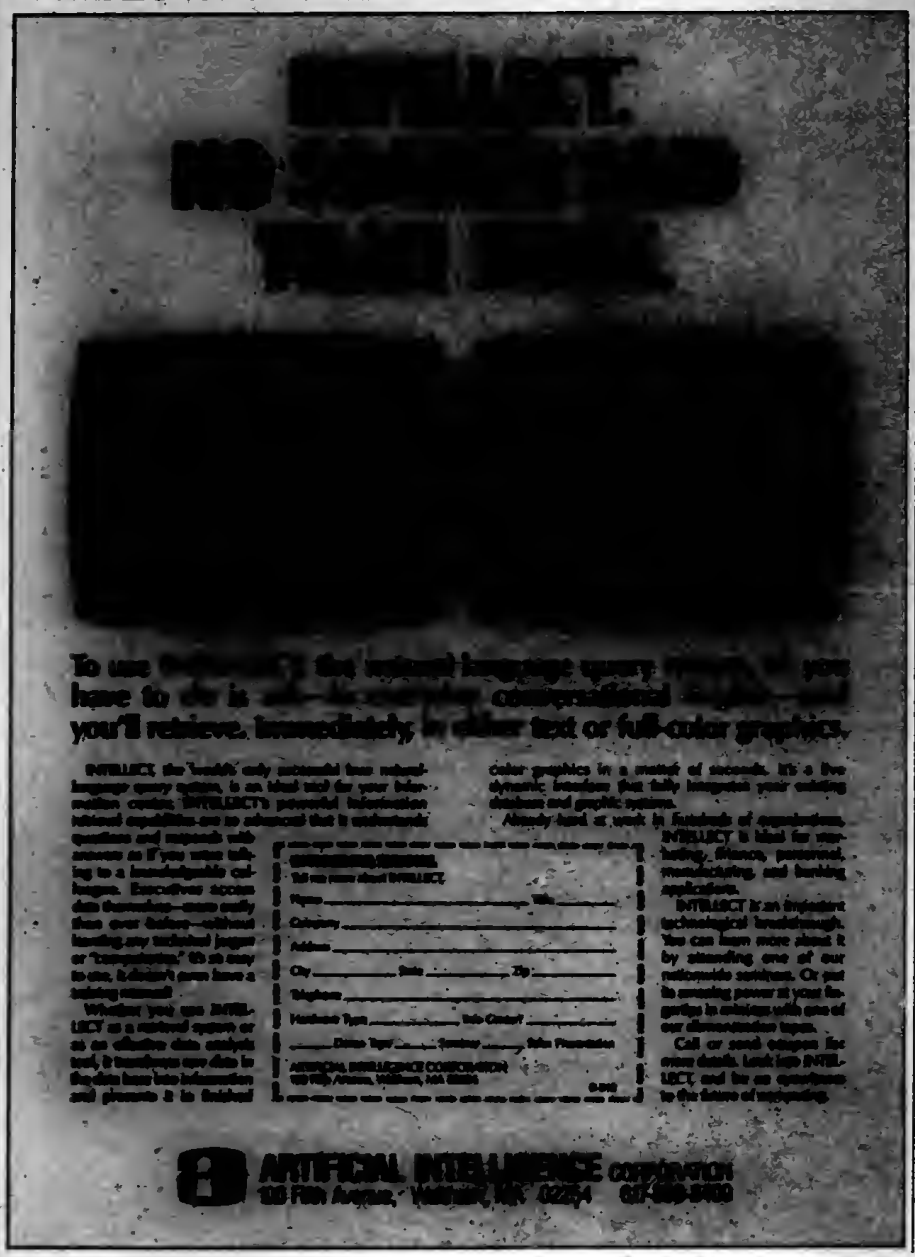
A terminal emulation facility is used when accessing host systems that do not natively support 3270 terminals or when existing applications were designed for non-3270 screen formats.

The NP supports both interactive and store-and-forward message switching and can also be used as a remote concentration device that provides local polling, a vendor spokesman said.

The system is available in several different configurations. The hardware consists of modular 16- and 32-bit CPUs and microprocessors. These configurations are designed to support from two to several thousand end points (terminals and printers) and a variety of hosts, terminal types and protocols. Stations can be connected via dial-up, leased or direct-wire lines. Auto-call support is also provided, the vendor said.

A processor with 128K bytes of memory with up to eight communications ports and a 12M-byte disk is priced at $20,000. The base price for the software is $100,000.

Advanced Computer Techniques, 16 E. 32nd St., New York, N.Y. 10016.



PROTOCOL CONVERTERS

PERLE GSD, LTD.
PDS 300/525 Release 15

Perle Gsd, Ltd., in conjunction with Perle Systems of Toronto, has announced Release 15 of the PDS 300/525 protocol converter. In an effort to add value to its protocol converters instead of offering them as simple translation devices, Perle has targeted the Release 15 at remote printing applications.

Release 15 enables an IBM System/34, 36 or 38 to be programmed to dial up and access remote devices, including the 5256 or 522X IBM printers.

The PDS 300/525 protocol converter is a diskette-based unit. It is available in 4-, 8-, 12- or 16-port configurations.

Prices range from $4,800 to $13,500.

Perle Gsd, Suite 507, 600 S. Dearborn St., Chicago, Ill. 60605.

ICOT CORP.
Protocol conversion

Icot Corp. has announced an IBM 2780/3780 to 3270 Binary Synchronous Communications (BSC) protocol conversion capability for its Crystalink 25X series of communications processors.

The series of communications processors can interface multiple standard IBM 2780/3780 RJE devices to an IBM host as a 3271 cluster controller communicating in 3270 BSC. A maximum of 27 RJE devices can be accommodated in the Model 257 communications processor — the largest of the Crystalink family — the vendor said.

Prices for the series range from $5,200 to $30,000.

Icot, 630 Maude Ave., P.O. Box 7248, Mountain View, Calif. 94039.

LOCAL-AREA NETWORKS

BRIDGE COMMUNICATIONS, INC.
CS/1-X.25

Bridge Communications, Inc. has announced an X.25 option for its Communications Server/1 Ethernet interface unit.

The CS/1-X.25 is a software and interface board option that enables the company's Communications Server/1 to serve as a front-end processor to host systems with X.25 interfaces.

This enables a host to be connected to an Ethernet network through a single X.25 interface, instead of

COMMUNICATIONS

through the 32 individual RS-232 ports previously needed, and increases to 48 the number of simultaneous sessions supported.

After the product is installed in front of the host, any terminal linked to another Bridge CS/1 or CS/100 unit can access the host, the vendor said. Hosts connected to different CS/1-X.25s can transfer files using their standard X.25 file transfer utilities.

CS/1-X.25 accommodates the three standard interfaces: RS-232C, RS-422/449 and V.35, a company spokesman said. The price is $13,000.

Bridge Communications, 10440 Bubb Road, Cupertino, Calif. 95014.

RAYCOM SYSTEMS, INC.
Raycom 2000 enhancement

Raycom Systems, Inc. has announced a multipoint/broadcast enhancement for its 2000 interconnect system for office, medical, scientific and industrial automation networks that use fiber-optic technology.

The enhancement reputedly allows any device to communicate with all other devices on the network. A multipoint protocol can be used to transmit data to all devices connected to the network.

The Raycom 2000 costs $150.

Raycom Systems, 6395 Gunpark Drive, Boulder, Colo. 80301.

TEST EQUIPMENT

INTERNATIONAL DATA SCIENCES, INC.
Bert/Blert for Hawk Model 4010 Datatrap

International Data Sciences, Inc. has announced additional features for its Hawk Model 4010 Datatrap and modem terminal simulator. The CRT now incorporates full bit and block error rate (Bert/Blert) testing as a standard feature.

The enhancement features full screen display of Bert/Blert functions, error rates and Bert patterns, a company spokesman said.

The 4010 costs $2,995. Existing field units may be upgraded, according to the vendor.

International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

DATACOM NORTHWEST, INC.
Datamonitor

Datacom Northwest, Inc. has announced the RS-232 V24 Datamonitor, a pocket-size device that is powered by the lines it monitors.

Seven LEDs monitor positive voltage transitions. The product has an extra female DB25 connector to allow the connection of additional data testing equipment, the vendor said.

The price is $99.

Datacom Northwest, 11300 25th Ave. N.E., Seattle, Wash. 98125.

AUXILIARY EQUIPMENT

COMPUSERVE, INC.
Interchange

Compuserve, Inc. has announced Interchange, a private videotex information service for corporations and government agencies.

Information is presented through a structure of menu pages. By choosing among the options presented, users can locate, retrieve and respond to the information of interest.

Examples of applications include office project scheduling, job listings, training programs, dissemination of high-level management directives, policies and procedures, order entry functions and newsletters. Product line price revisions, reporting policies and procedures and sales reporting are also appropriate for the videotex medium, the vendor said.

The price for two-part, unlimited access to Interchange and the company's electronic mail service is $5,000/mo for a yearly commitment, according to the vendor.

Compuserve, 5000 Arlington Centre Blvd., P.O. Box 20212, Columbus, Ohio 43220.

TELEPROCESSING PRODUCTS, INC.
TP-550

Teleprocessing Products, Inc. has announced the TP-550 channel service unit, an interface unit designed for Dataphone Digital Service (DDS) circuits.

The unit supports DDS speeds of 2,400, 4,800 and 9,600 bit/sec. It connects to a data service unit by means of a six-wire interface and to the DDS channel with a four-wire interface, according to a spokesman for the vendor.

The TP-550 channel service unit costs $540, according to the spokesman for the vendor.

Teleprocessing Products, Building 7E, 4905 E. Industrial St., Simi Valley, Calif. 93063.

CORPORATION FOR DISTRIBUTED SYSTEMS
COM-80 Communications Interface

Corporation for Distributed Systems has announced the COM-80 Communications Interface for Hewlett-Packard Co. Series 80 personal computers.

The interface enables the user to turn a Series 80 into an applications-oriented intelligent terminal and allows it to communicate with a host computer. The interface applications are function-key driven and include 2780/3780 RJE terminal emulation and asynchronous terminal emulation with file transfer capabilities, the vendor said.

In the bisynchronous mode some of the COM-80 capabilities include:

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support for standard speeds to 9,600 bit/sec, operation in point-to-point or switched-line environments, operation in conversational mode and automatic conversion of Ascii to Ebcdic.

Among other things, the asynchronous capabilities include standard bit rates to 9,600, according to a spokesman.

The price is $845, the vendor said.

Corporation for Distributed Systems, 15840 Addison Road, Dallas, Texas 75248.

PELORUS, INC.
Pelorus 2000

A new device recently introduced by Pelorus, Inc. speaks to telephone callers with synthesized speech and allows them to enter data to a computer system using the keys on a Touch-Tone phone.

The Pelorus 2000, with its current set of 240 words, can be programmed to ask callers to enter data such as stock numbers and prices. It can also be used for sending telegrams.

The Pelorus 2000 sells for $6,000.

Pelorus, 3624 Marcut Court, Monkton, Md. 21111.

VOICE/DATA COMMUNICATIONS

ISOLATION SYSTEMS
Enigma Secure Communications System

Isolation Systems has introduced the Enigma Secure Communications System, an integrated security and communications package for the IBM Personal Computer.

The system has a network capability of 64 terminals providing for over 2,000 potential individual links over the public telephone system. Security features include hardware-based, high-speed Data Encryption Standard encryption, key management, network organization, access control, tamper detection, authorization hierarchy and dial-back facility.

Isolation Systems, 1691 The Queensway, No. 6, Toronto, Ont. M8Z 5Y4.

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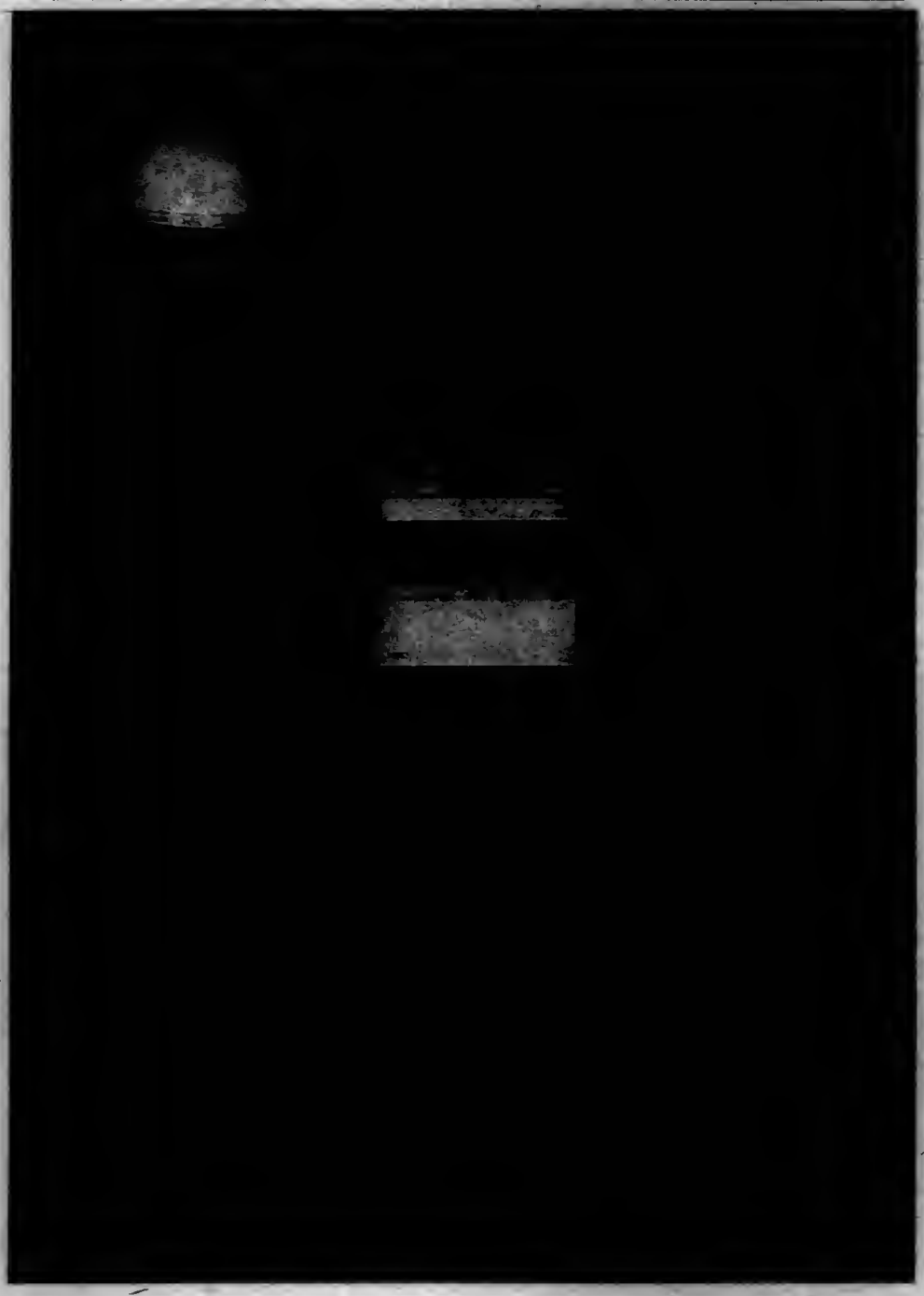
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Gerhard & Associates
Columbus, (614) 488-9751

PENNSYLVANIA
American Datacomm, Inc.
Pittsburgh, (412) 381-1600
W.J. Westy Associates
Norristown, (215) 539-1217

PUERTO RICO
Codecom
San Juan, (809) 781-9797

TEXAS
The Thorson Company
Austin, (512) 451-7527
The Thorson Company
Dallas, (214) 233-5744
The Thorson Company
Houston, (713) 771-3504

NEC
NEC America, Inc.
Data Communications Products



IN DEPTH



A tale of hope for anyone. . .

Lost in the software forest primeval

By Donald V. Steward

Once upon a time, programmers needed only flowcharts to find their way through the programming forests, for indeed the forests were small and they could see out in most directions. But as the forests got bigger and thicker, they lost their ways, wandering endlessly through the GOTOs, trying to remember where they came from. And the forests were filled with mutterings of, "We're 99% through the forest. Surely the next turn will lead us out into the light." And those who waited wrung their hands. And systems were late and their costs were outrageous. And nothing could be done. For sending more people into the forest caused more people to be lost in the forest.

Then a wise man said, "Of course you are lost and befuddled. You must put aside your foolish use of GOTOs, for they will mislead and confuse you." And someone remembered that a psychologist had once said, "I have found that people can only work with a very little amount of memory at a time." And someone said, "Yes, if

The wise men of systems analysis appear to go in different directions. Which one should project developers follow? A consultant takes a little from the different approaches and says, "It's so much simpler now."

you look at the whole forest, then a piece, and then a piece of that piece, you will finally be able to see the trees for the forest, yet you will only need a little amount of memory." Some called this methodology Top-Down, and others called it Successive Refinement or Hierarchical. It was shown that you could always write programs this way, and this way was called Structured Programming. And many people put "Structured" in the titles of their books and sold many copies, for indeed, Structured was good.

Now if Structured was good for programs, then surely it must be good for systems. So a wise man took his Data Flow Diagramming methods and called them Structured Systems Requirements, and he went throughout the country teaching all who would listen. And another wise man, hearing of a marvelous method from a faraway country, developed the Warnier-Orr diagram and called it Structured Systems Design, and he too went throughout the country, also teaching all who would listen. Other wise men looked at data flow between modules and called it "coupling" and said too much of it is bad; they looked at data flow within modules and called it "cohesion" and said it was good. And they showed how modules built this way were easy to program and maintain. And they called this Structured Program Design.

Now the wise men all agreed and said to the systems analyst, "Keep it simple" and "Do it top-down so your customer can review what you have done and tell you that you are doing it all wrong. And this is good because it saves you from building great buildings that fall down because they are built on foundations of sand." But to keep it simple, they said, "You cannot show this, or cannot show that." And so the customer saw and he said, "You have not shown this, and I don't think you understand what I want." And the programmer saw and said, "You have not shown that, and I don't know how to do it." And so both were confused. So the analyst couldn't go top down from the top to the down without cheating on the rules or changing the way the system was described.

Some wise men said, "We have shown other people how to use computers. Why is it we never use them ourselves?" So they developed ways to use computers to help do systems development. But these systems became very complicated and not many people knew how to use them. So they were used only by big companies.

And so there were many wise men. And they all said "Structured this" or "Structured that." And it was found that their methods were good, and programmers could always find their way through the forests. Well, almost always. So the followers of these wise men were happy. But when you followed one wise man it was hard to follow the other wise men too, for they often appeared to lead in different directions. And so programmers again became befuddled.

And college professors said, "We have the responsibility to show our students the true path," but they don't know which path was the true path. Some of their students go into a world led by one of these wise men, and others go into different worlds led by different wise men. And even some go into worlds where flowcharts still reign. And so the professors had their students buy many books.

And then a consultant and professor, hearing all this, said, "I think I understand what these wise men are all trying to say." He took a little here and a little there; he changed this and changed that and said, "I think it all fits together now. And it looks so much simpler."

And thus we leave this tale to enter the real world of systems development.

The tools we will describe are a compatible set. Each tool will be derived from one of the conventional tools, but will be modified and extended to make it more powerful, simpler to use and compatible with the other tools in the set. Among the conventional methods drawn from are Warnier-Orr methodology (K.T. Orr, *Structured Requirements Specification*), data flow diagramming (T. DeMarco, *Structured Analysis and System Specification*) and structured design (E. Yourdon and L.L. Constantine, *Structured Design: Fundamentals of a Discipline of Computer System Design*).

Trees

The Tree is derived from the Warnier-Orr diagram. But by using a Tree, it is possible to work with one system from the very top level at which the customer sees and understands what he wants done, down through several levels of detail, until enough logic and detail have been added that the computer program can be generated mechanically.

If you watch how people use Warnier-Orr diagrams, you will see that they violate the rules. Many of the rules for Trees are merely a formalization of this cheating.

It will also be shown how the Tree

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can represent the control of parallel operations and how the data flow in the Tree can be revealed to help in developing the structured design of the modules.

Two-entity data flow diagrams

Our two-entity data flow diagram is a variation of the conventional data flow diagram.

Both use the same hierarchical methods for developing a system top down. But in using a two-entity data flow diagram, it is possible, where appropriate, to show the control at the greater levels of detail. Where this detail may be confusing, it can be left off.

Because we can show the data flow in a Tree and show the control in a data flow diagram — and because both can show parallel or unordered operations — it is possible to translate between one and the other, showing that the two methods are completely compatible.

Data structure matrices

The two-entity data flow diagram can be represented by a matrix, related to the Langefors matrix method. Then, combined with a data element dictionary, it forms a data structure matrix.

Using the data structure matrix, it is possible to analyze the system to see the effects of changes, to obtain the sizes of data stores, volumes of data flows, frequencies and timing of the execution of modules and the critical path timing of transactions through the system.

The data flow matrix can be represented in a data base, making it possible to do these analyses on the computer. In addition, all the current information is simultaneously available to anyone with access to the data base.

Top-down development

All these methods depend upon the idea of a hierarchy. A system that can be represented as a hierarchy can be developed top-down.

A hierarchy is like a set of boxes nested inside each other (see Figure 1). Each box has on its top an overall description of what is inside or what is to be done with what is inside. The details inside can only be seen by opening the box. As you look at one box, you do not have to worry about the details inside that box or about any of the other boxes.

Developing a system top-down involves defining the outer boxes first, then the inner boxes. The outer boxes describe what needs to be done. The inner boxes describe how to accomplish it.

The usual form of flowcharts is not very useful in this mode of thinking. They cannot generally be understood in a succession of chunks, each small enough to be mentally digestible. GOTOs can also do violence to this form of thinking by taking you from hither to yon without any underlying structure.

How do we represent such a hierarchical structure? By a tree. The branching structure of a tree corresponds to the hierarchical nesting of structures within other structures. (The Tree and some other ways of showing nesting are shown in Figure 1.)

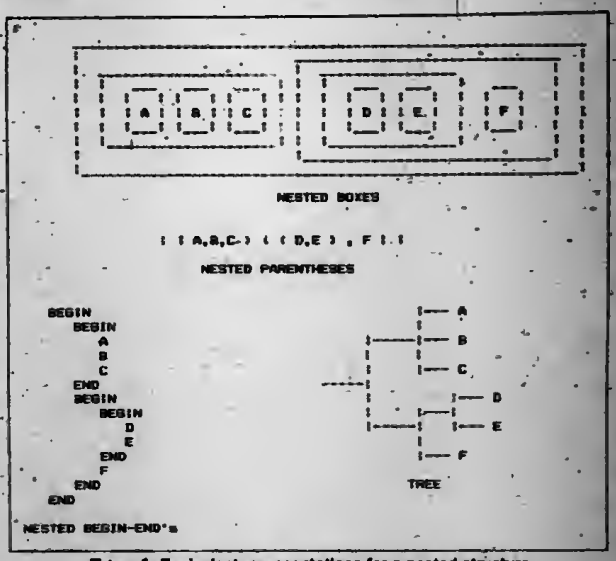


Figure 1. Equivalent representations for a nested structure

Programs as Trees

The Tree can be put to practical use with just the following rules, an elementary knowledge of structured programming, paper, pencil and a ruler. (The Warnier-Orr diagram has an advantage to its author because he can sell you a template to make the parentheses. Unfortunately, the author of the Tree probably wouldn't make much money selling you a straight edge.)

Any structured program can be represented as a Tree. The rules for a Tree are very simple. (You may wish to look at Figure 2 as you read these rules.)

1. The execution of the program begins and ends at the root. We refer

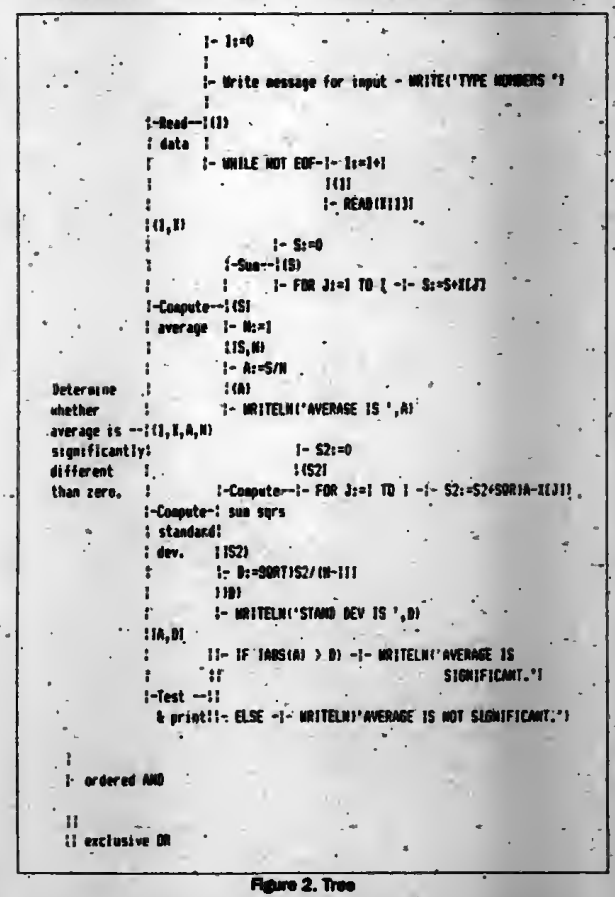
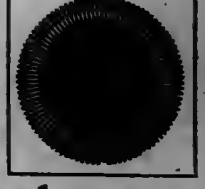


Figure 2. Tree

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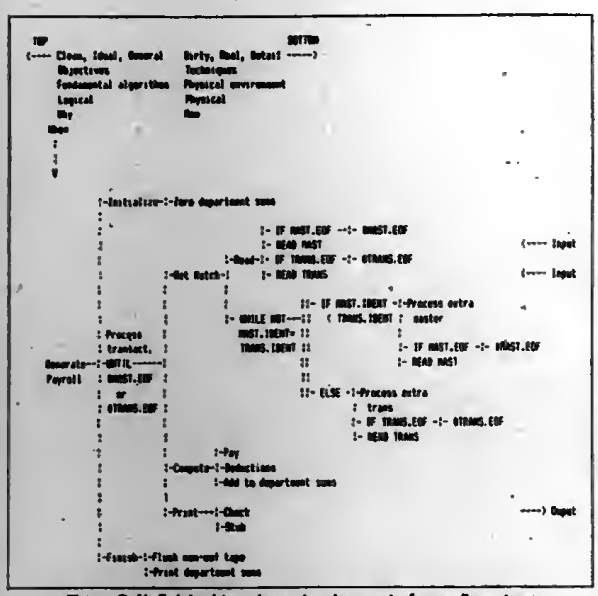


Figure 3. Unfinished top-down development of payroll program

to the root as the top of the Tree, but it is actually drawn at the left of the page. The root contains a general description of what the program does. Putting the "top" to the left and "bottom" to the right makes it easier to write text on the branches.

2. The vertical lines are called limbs, the horizontal lines, branches. The branches off the same vertical limb are executed in sequence, top to bottom.

3. The execution of a branch is completed once the subtree entered through that branch is completed. We may think of control as entering and exiting the subtree through the branch.

4. A branch may have on it a remark, a control statement or both. A remark describes what the subtree entered through that branch is to do. A control statement tells the conditions under which the branch is to be entered or how the subtree beyond is to be iterated.

5. The control statements are consistent with those used in structured programming languages: "IF condition," "WHILE condition" and "FOR variable = expression1 TO expression2." They control the execution of the subtree entered through that branch.

6. Remarks are written in capitals and lower case. Control and executable statements are written in all capitals.

7. A double limb is used to show that the branches off that limb are mutually exclusive; that is, at most one of these branches is executed. This structure is used to represent IF_THEN_ELSE and CASE.

8. A wiggly limb is used to show that the branches off that limb may be executed in parallel, or in any order.

9. The end branches, called leaves, are the executable statements, such as READ, WRITE and Assignment (that is, variable = expression).

10. A procedure call is shown on a leaf by the name of the procedure in capitals. A procedure can be represented by a Tree, with the procedure name at the root.

11. Recursion is shown by a call to a procedure within a procedure of the same name.

These rules are illustrated by the Tree in Figure 3.

Has the GOTO gone forever?

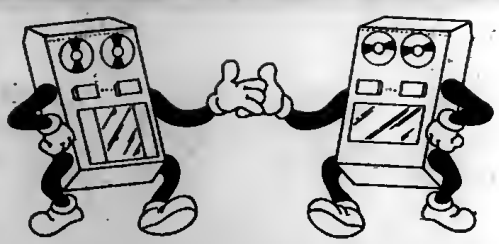
The GOTO has been hard to eliminate. Even Pascal has a GOTO for those few times when they are hard to avoid without introducing unnecessary complexity. But the Tree is a pure hierarchical form. To make the Tree work well, we must eliminate the GOTO forever. It is our claim that the "UNTIL #event" does precisely that.

The "UNTIL #event" is written on a branch. It causes the subtree entered by that branch to be iterated until the event occurs, at which time the subtree is immediately exited through the UNTIL branch. (By convention, the event name starts with #.) The event can be located anywhere within the subtree entered through the UNTIL branch, any number of levels beyond (see Figure 3.)

The "UNTIL #event" is not yet a standard structured language construct, so it must be simulated in these standard structured languages using a GOTO. It is our claim that the simulation of an "UNTIL #event" is the only time that a GOTO is ever needed, and if the language had the "UNTIL #event" construct implemented, no GOTO would ever be needed, nor would one have to write clumsy code to avoid it.

Note that the "UNTIL #event" acts like a "come from," showing where the control transfers when the event occurs. This allows an exit, not just to the next higher level, as in

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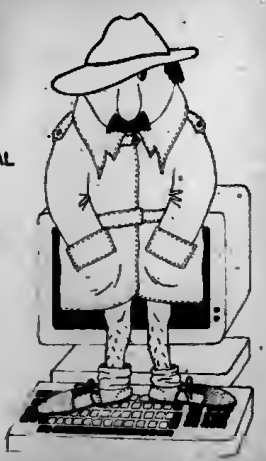
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```
                        /--PROCEDURE-A(FLAGA)
                        \
   -UNTIL FLAGA or FLAGB--/
                        \
                        /--PROCEDURE-B(FLAGB)
```

Figure 4

some languages, but to any higher level where one is prepared to handle the consequences of the exit. This device is particularly useful for exiting on end-of-file or error conditions (see Figure 3).

The "UNTIL #event" and the wiggly line are useful in handling asynchronous processes. Parallel processes off the wiggly line can be initiated and continued until interrupted by an event or by conditions on one or more events. An exit then occurs through the UNTIL branch (see Figure 4).

Top-down development

Remarks are used in top-down development to describe initially *what* is to be accomplished. Later, the details showing *how* it is to be done are supplied as the Tree is expanded to the right.

Thus, as the Tree develops from left to right, details get resolved. The user can initially use the Tree to express with remarks on the branches what he wants done. The analyst then expands this Tree to further levels of detail, and the programmer expands it further yet, until finally it can be translated mechanically into the source code of a structured language. An advantage of the Tree is that one can undertake this whole top-down process with no need to change the form of representation.

The Tree can be understood by the user, analyst and programmer alike, so that each has some assurance that what the others are doing is consistent with what he is doing. Each can see his own contribution and how it affects and is affected by everyone else's. If a change in the intent of what is to be done occurs at the top of the Tree, corresponding changes are forced on the implementation below. The whole process from conception to program is represented with growing detail, maintaining an integrity that comes from working within only one expanding diagram.

Another example

Figure 5 shows the beginning of the development of a payroll program. It shows how the top level of the program can be developed, leaving details until later.

In this example, the root tells us what the program is to do: "generate payroll." Then the branches are filled in to show how to do this. These details may not be known at first, so remarks are inserted showing what is to be accomplished, allowing the details of how it is to be done to be filled in later. The order in which these details are developed is at the convenience of the developers and need not follow the sequence in which the program executes them.

In the payroll program, the basic structure comes from processing matched records from two files until one of the files runs out of records. This process is shown by the UNTIL branch. There is an Initialize and a Finalize branch, but their details are deferred until the completion of the UNTIL subtree is worked out, at which time it is known what to Initialize and what to Finish.

Moving from left to right in the Tree shows *how* to do it, and moving from right to left shows *why* it is done. Moving from top to bottom of the limbs shows *when* it is to be done. Basic algorithms occur toward the top. Adaptations to specific environments occur toward the bottom. Modifications to accommodate the program to a new environment will usually affect only the bottom of the Tree.

Figure 3 also illustrates that branches can be interpreted as states, that is, the set of circumstances that exist at that point in the program. "Get Match" is a state in which a match exists between a transaction record and master record. When the subtree is exited through



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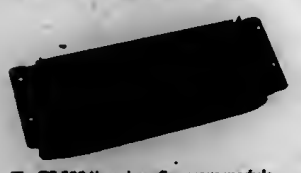
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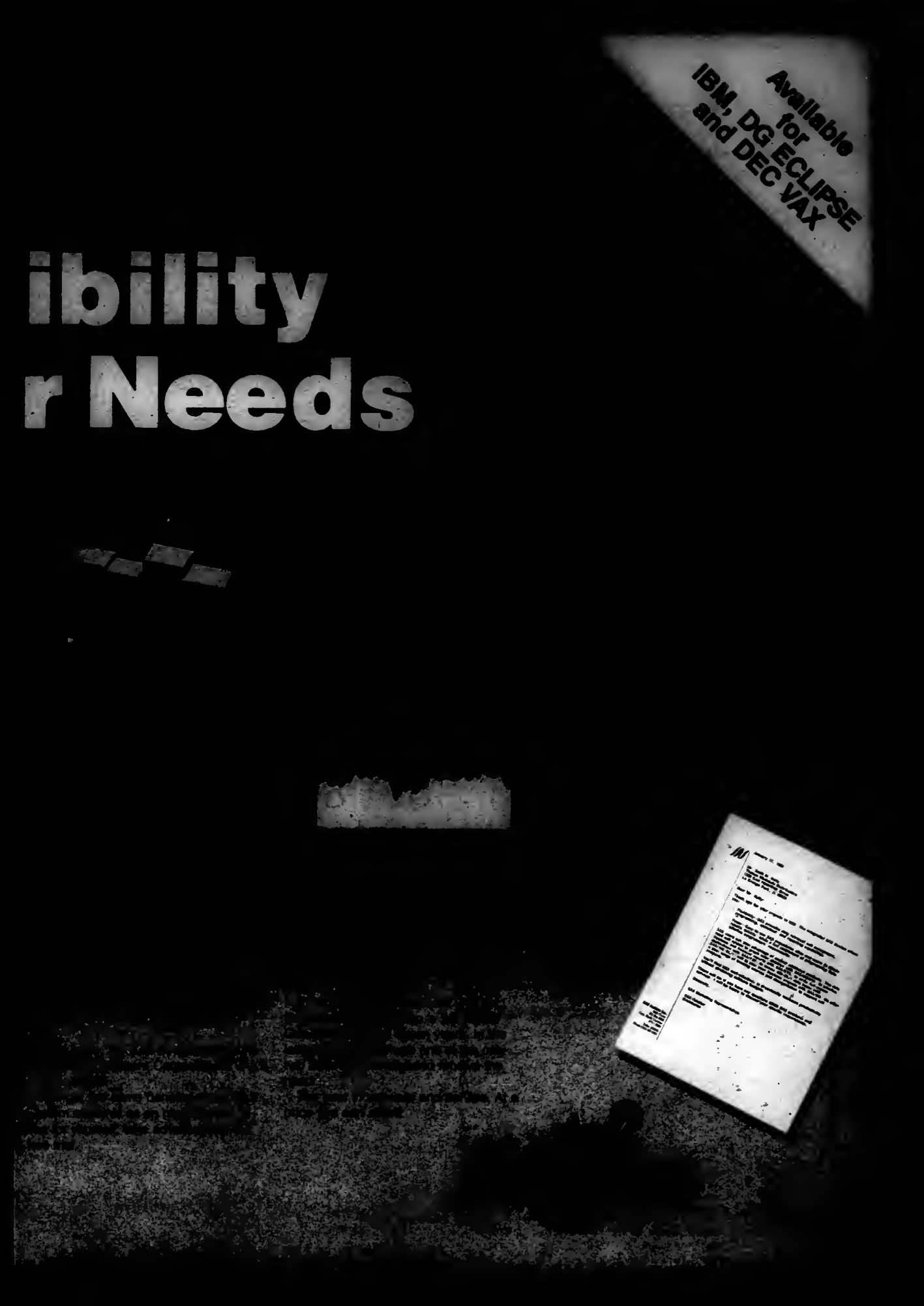
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Once the Tree is fully detailed, it becomes merely a mechanical process to have the Tree translated into a structured language, then compiled into an operating program. This process would not be possible if the Tree had not allowed a level of detail consistent with that required in the final program.

that branch, a match exists. Other parts of the program need to know that this match state exists, but need not know how it was produced. The details of how the match is made occur beyond the branch.

The Tree is like a management structure. At the top, everything is simple. At the bottom is the nitty-gritty. In between, the simple is matched to the nitty-gritty.

The major interfaces are defined at the top. They must be defined before the modules they tie together are designed. Any change in these interfaces will tend to affect everything below. Changes at the bottom are easier to make without affecting other parts.

The top represents the logical principles of, say, an accounts receivable system. The bottom represents the details of how the principles are applied to a particular physical implementation.

Tree editors

Trees become particularly useful when they are developed using a Tree editor. The Tree is then captured in a data structure as it is developed. The editor can then be asked to display or print out just those parts of the Tree or levels of detail that are desired. This capability makes the editor an interactive, living document, a great advantage over a dead piece of paper.

Once the Tree is fully detailed, it becomes merely a mechanical process to have the Tree translated into a structured language, then compiled into an operating program. This process would not be possible if the Tree had not allowed a level of detail consistent with that required in the final program.

Figure 5 shows how a subtree may be displayed on the editor screen. At the top of the screen is shown the sequence of parents leading to the subtree. Below is shown the subtree in indented form. Indented form is more compact for displaying on the screen. The user is in control of what part of the Tree he wishes to display or edit. He can also print out the Tree or any part of it in Tree form on a printer.

Structured design

Structured design focuses on developing programs that have low coupling (low data flow between modules) and high cohesion (parts working intimately together to satisfy a common goal within modules). The modules are our subtrees. Low coupling and high cohesion have been found to contribute to making programs easier to develop and to maintain. Changes in one module can only affect other modules through the data flows. Thus, keeping the number of data flows to a minimum makes it easier to keep track of the consequences of a change.

Data flows down the limbs. Next to the limbs we can show within parentheses the data elements that are produced above and used below that limb segment. (This finally explains the funny information in parentheses you were wondering about in Figure 2.)

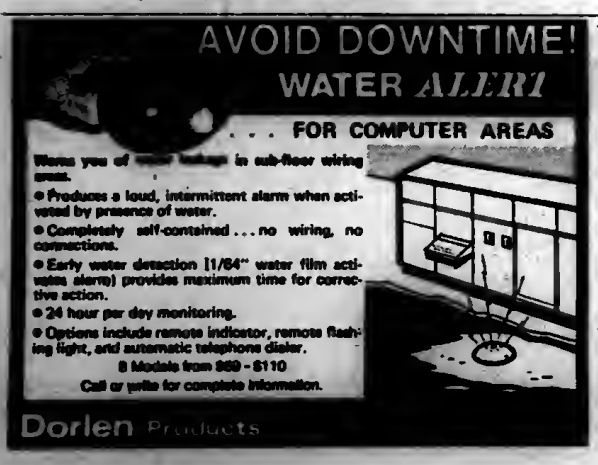
The data flows shown on the

```
+-----------------------------------------------------------------+
| Determine whether average is significantly different than zero. | Top shows ancestors
| Compute stan. dev.                                              | unindented
| ----------------------------------------------------------------|
| Compute sum sqrs                                                |
|    FOR J := 1 TO I                                              | Bottom shows subtree
|       S2 := S2 + SQR( X[J] - A )                                | in indented form
|                                                                 |
|                                                                 |
+-----------------------------------------------------------------+
```

Figure 5. Tree editor screen

```
                        |- I  := 0
                )-Initialize---|- S  := 0
                )              |- S2 := 0
                :(I,S,S2)
                :
                |- Write message for input - WRITE('TYPE NUMBERS ')
                :
                |- Read data - WHILE NOT EOLN -|- I:=I+1
                |                              |- READ(X[I])
                :X,I,S,S2,I)
                :
                |- FOR J:=1 TO I-1 -|- S:=S+X[J]
                :
Determine       :X,I,S,S2,I)
whether         |             |- N := I
average is ---- |-Compute-----|- A := S/N
significantly   | average
different       |
than zero       :X,I,N,S2,I,A)
                |
                |-Compute-----|- FOR J:= 1 TO I -|- S2:=S2+SQR(X[J]-A)
                | stand. dev. )(S2)
                |             |- D := SQRT( S2 / (N-1.0) )
                :(A,S)
                |
                |-Test--------||- IF (ABS(A) > S ) -|- GR:=TRUE
                |             ||
                |             ||- ELSE--------------|- GR:=FALSE
                :(A,S,GR)
                |             |- WRITE('AVERAGE IS ',A)
                |             |- WRITE('STAND DEVIATION IS ',S)
                |             |
                |             | ||- IF GR -|- WRITE('AVERAGE IS
                |             | ||                      SIGNIFICANT.')
                |             |-||
                |               ||- ELSE--------|- WRITE('AVERAGE IS NOT
                |                                       SIGNIFICANT.')
```

Figure 6. Tree for same problem as Figure 2, poor structure (less cohesion — more coupling)



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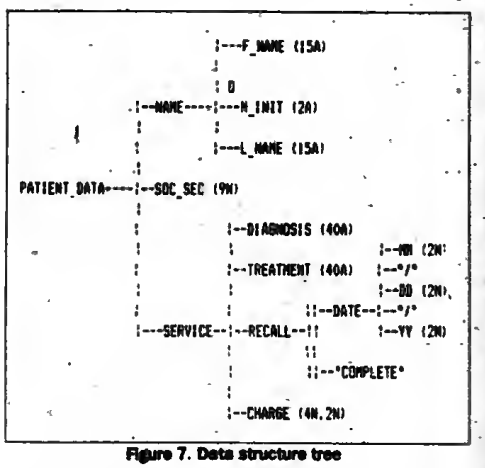


Figure 7. Data structure tree

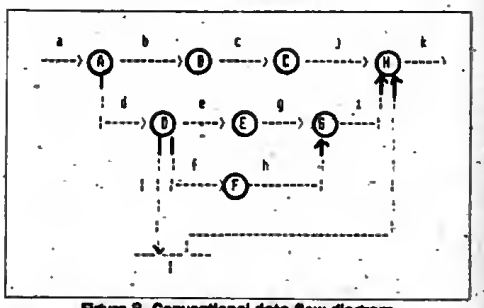


Figure 8. Conventional data flow diagram

limbs of the Tree make the coupling clear. A well-structured program will have a small volume of data flow on the high limbs (to the left), resulting in a low coupling between modules. Low coupling between modules results in high cohesion within the modules. Low coupling and high cohesion are opposite sides of the same coin.

Comparing the two versions of the same program shown in Figures 2 and 6, we can easily see that the program design in Figure 2 is better, having less data flow along the higher limbs, thus implying less coupling and consequently more cohesion.

Using the Tree and the following rules will generally produce good structured program designs:

1. Minimize the data flows on the high limbs.
2. Let the major decisions be made toward the top.
3. Keep the data and operations at the top logically clean and simple. Keep the dirty considerations about data structures on external media at the lower end of the Tree.
4. Introduce extra levels of limbs and branches as needed to keep from having too many branches exiting from any one limb.
5. Generally minimize the distance between where variables are initialized or first produced and where they are used.

Data structures

Note that the Tree helps us relate the control to the data structure to be used. Looking at Figure 4, we see that the "READ MAST" and "READ TRANS" branches deal with two records, each with their own information about an individual. The "GET MATCH" branch implies that the rest of the program may now deal with only one structure having all the necessary information about the same individual from both the master and the transaction records.

Figure 7 shows how a Tree can also be used to represent data structures. Here, O on a branch means "optional," "*" means "any number of times" and quotes enclose literals. Within parentheses is shown the number of numeric digits (N) or the number of alphabetic characters (A). Only one branch is taken off of a double vertical limb.

The Data Tree can be used to develop the Program Tree with the Warnier-Orr methodology. However, this technique will not be covered here.

Data flow diagrams

A data flow diagram shows the flow of data in a system. In a conventional data flow diagram, the bubbles represent processes and the arrows between the bubbles represent the data flows. Data storage is represented by a straight line (see Figure 8).

We have found a variant of the conventional data flow diagram to be very useful. We call this variant the two-entity data flow diagram. Processes are represented by rectangles rather than bubbles, and data flows are represented by ovals rather than labels on the arcs. Since the arcs no longer carry the data flow labels, they can now be used, when appropriate, to carry the conditions under which various data exits a process. A data flow going to more than one process is shown as an oval with multiple exiting arrows, rather than several arrows with the same label as in a conventional data flow diagram. Figure 9

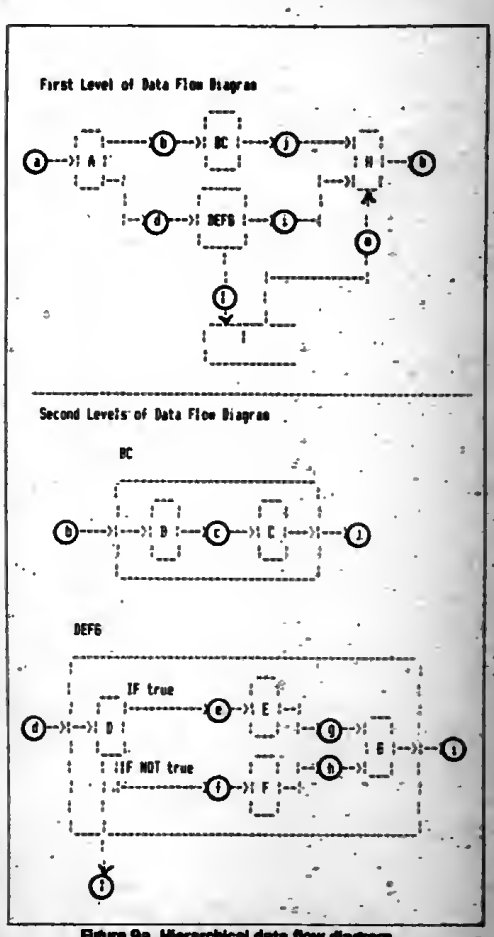


Figure 9a. Hierarchical data flow diagram

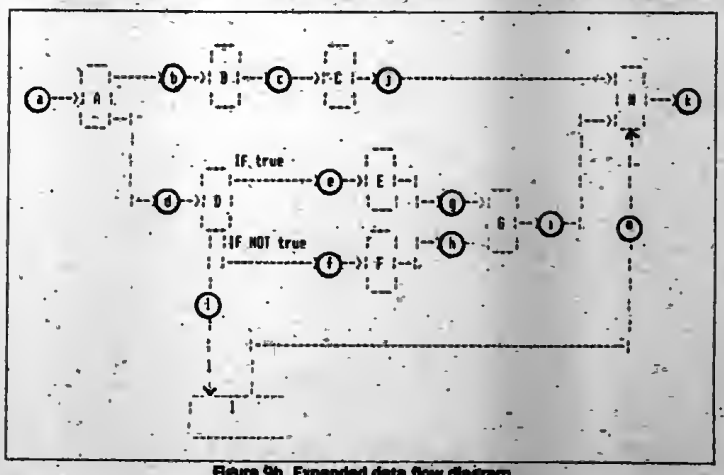


Figure 9b. Expanded data flow diagram

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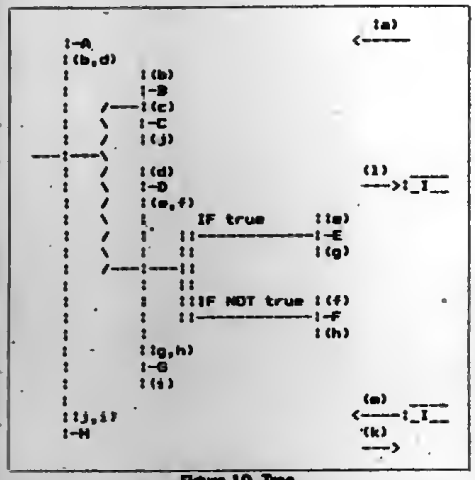


Figure 10. Tree

shows the two-entity data flow diagram corresponding to the conventional data flow diagram in Figure 8.

The two-entity data flow diagram has features that are similar to the Petrie diagram used to represent control systems.

The mathematician will see that processes are like operators; data flows are like operands. A process (operator) takes data flows (operands) as input and produces data flows as output.

Processes and data flows follow the sandwich rules: Between two processes there is a data flow, and between two data flows there is a process. We will see later how this observation makes it possible to represent a two-entity data flow diagram in the form of a matrix.

To be consistent with the sandwich rule, we represent a data storage as an open-ended rectangle. It has the same role in the sandwich as a process. Data can flow between a storage and a process. This approach treats a storage as a process that consumes or produces data, which is consistent with some modern thinking about data base machines.

The diagram can begin or end with either a process or a data flow.

One-page diagram

Data flow diagrams (either conventional or two-entity) for complex systems are developed as hierarchies. The whole system may be represented as a one-page diagram showing just the major parts of the system. Each of these parts is expanded in other diagrams. This expansion goes on until we have rectangles that represent sufficiently primitive processes that we are ready to program them. At this stage, we may wish to translate them to a Tree, an inconvenience we could avoid if we developed the whole system as a Tree. (But some customers prefer to see data flow diagrams rather than Trees.)

Figure 9 illustrates some of the rules for expanding the data flow diagram into more detailed diagrams. Each diagram should be simple enough that it can be easily understood without concern for distributing details. It can usually fit on one 8½-by-11-inch page.

Data flow diagrams (either conventional or two-entity) for complex systems are developed as hierarchies. The whole system may be represented as a one-page diagram showing just the major parts of the system. Each of these parts is expanded in other diagrams. This expansion goes on until we have rectangles that represent sufficiently primitive processes that we are ready to program them.

Each process rectangle in each diagram is numbered and can be expanded into another diagram. The diagram will have the same number as the process rectangle it represents. A decimal number system is sometimes used to keep track of which process is the expansion of which other process. For example, 4.3.6.2 would be process 2 in the diagram expanding 4.3.6.

A diagram that is the expansion of a rectangle has a boundary drawn corresponding to the boundary of that process rectangle in the higher level diagram. Outside this boundary are just the immediate inputs and outputs of this process, as shown in the higher diagram. Within this boundary is the expansion of the process. At each level of expansion, all the inputs and outputs that appear at the higher level must be accounted for. This expansion is repeated until the remaining processes are sufficiently primitive that they need no further expansion to be understood and programmed.

Note that hierarchy is shown in the data flow diagrams by a set of diagrams. In the Tree, the hierarchy is shown naturally as the branching of the Tree.

In the literature developing conventional data flow diagrams, this hierarchical development is referred to as "partitioning." This application of the word, however, is quite contrary to the way

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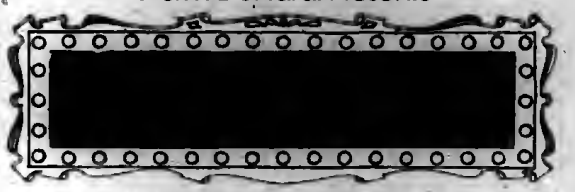
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DATA FLOW MATRIX

DATA FLOWS

FILE	a	b	c	d	e	f	g	h	i	j	k	l	m	
1												1	1	0

PROCESS	a	b	c	d	e	f	g	h	i	j	k	l	m	FREQ /DAY	HRS	EXTERNAL TRIGGER
A	1	1	0		0	1								100	2	Arrival
B			1	1	0									100	3	
C				1							0			100	1	
D					1	01	02					0		100	4	
E						1		0						.95	1	
F							1		0					5	2	
G							11	12	1	0				100	1	
H								13	13	1	0	1	1	100	2	

01 = IF true 02 = IF not true

DATA ELEMENT MATRIX

DATA ELEMENTS	DATA FLOWS a	b	c	d	e	f	g	h	i	j	k	l	m	FILES 1
aa I5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
bb A26	1	1	1	1	1	1	1	1	1	1	1	1	1	
cc I2		1	1	1		1			1	1	1			
dd I4				1										
ee A10					1	1	1	1	1	1	1	1	1	1
ff I5								1		1				

Figure 11. Data structure matrix

DATA FLOWS

	a	b	c	d	e	f	g	h	i	j	k	l	m	FILES 1
CHAR/REC	31	33	33	35	41	41	41	41	46	33	48	15	15	15
REC/DAY	100	100	100	100	95	5	95	5	100	100	100	100	100	200
K CHAR/DAY	3.1	3.3	3.3	3.5	3.9	.2	3.9	.2	4.6	3.3	4.8	1.5	1.5	3

Storage

K REC	5
K CHAR	75

TIMING

Process	Duration	Begin	Finish	
A	2	0	2	
B	3	2	5	
C	1	5	6	
D	4	2	6	
E	1	6	7	IF 01
F	2	6	8	IF 02
G	1	7	8	IF 01
G	1	8	9	IF 02
H	2	8	10	IF 01
H	2	9	11	IF 02

Figure 12. Worksheet

"partitioning" is used in other literature, that is, to draw boundaries to separate parts into distinct sets. We prefer the term "detailing" rather than "partitioning" for expanding the processes into more detailed processes. The term "partitioning" would better describe the reverse process, starting with a large diagram and partitioning its parts to develop a higher level diagram.

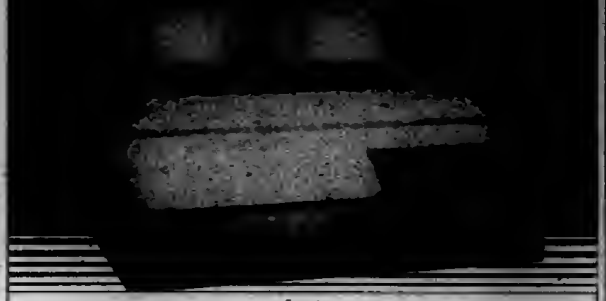
The data flow diagram emphasizes data flow, but the flow of data has implications on the flow of control.

The Tree emphasizes the flow of control, but the data flows can be shown on the limbs.

By putting information about flow of control in the data flow diagram, and information about flow of data in the Tree, the two are drawn closer together, making it easier to make the transition from one to the other.

Note that it is not necessary to show the control in the data flow diagram, nor the data flow in the Tree. These can be left out for a high-level view where it is felt the added detail would be confusing. But, it is possible to add this information when appropriate without having to go to a different type of diagram.

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The data flow matrix pulls a great deal of information about the system together in one place so that it can be analyzed for consistency and completeness. The matrix can be used to trace the effect of a change in a data element through the whole system. The matrix can also be used to make estimates of processing volumes and times.

The data flow diagram may imply that more than one process can go on at one time. In Figure 8, B and C can occur simultaneously with D, E, F and G. When programming with just one CPU, the programmer can make an arbitrary choice of which to do before the other. Modern applications more and more involve multiple control units that allow processes to be done simultaneously.

The relation between the two-entity data flow diagram in Figure 9 and the Tree in Figure 10 (on ID/12) can be readily seen. The processes are represented in the data flow diagram as rectangles and in the Tree as branches. The data flows appear in the data flow diagram as ovals and in the Tree as data flows on the limbs. Parallel processes are shown in the data flow diagram with multiple arcs exiting from the same process and in the Tree with wiggly limbs. Figures 9 and 10 demonstrate the relations between the two.

Note that in a two-entity data flow diagram, conditions can be shown at the exit of the process. This must be shown in the Tree in two steps: as the process followed by the decision, as is shown in Figure 10.

While data flows within the system are shown on the limbs, data flows into and out of the system are shown along branches entering and exiting at the leaves.

Where double or wiggly limbs obscure the data flow in or out of a process, a short limb, called a stub, is added to carry the data flow. For example, the data flows in and out of E, e and g, respectively, are shown on the stub above and below E.

Data flow matrix

We can develop a data flow matrix corresponding to a two-entity data flow diagram. In the matrix, the rows represent processes and the columns represent data flows. We use O's and I's to show where a data flow is the output or input of a process. Figure 11 (on ID/13) shows the data flow matrix for the two-entity data flow diagram shown in Figure 9.

The On's represent the conditions under which various output data flows are produced; for example, in Figure 11 the 01 represents the output under the condition True, the 02 under the condition not True.

The In's show the conditions under which the execution of a process is triggered to start by the presence of input data. If all the inputs are simple I's, then the process is triggered when all the inputs are available. If there are numbered inputs, then the process is triggered when all the inputs of any one number are available. For example, in Figure 11, it shows that G is triggered when it gets either g or h, and H is triggered when it gets both i and j.

The data flow matrix pulls a great deal of information about the system together into one place so that it can be analyzed for consistency and completeness. The matrix can be used to trace the effect of a change in a data element through the whole system. The matrix can also be used to make estimates of processing volumes and times, as discussed below.

We can also represent a data element dictionary as a matrix, called a data element matrix. Let the columns

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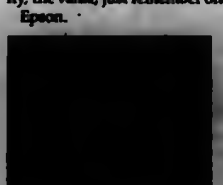
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The worksheet shows the number of characters in each record of a data flow or file (computed from the data structure matrix). The total number of records of a data flow processed per day can be computed by summing the frequencies of all the processes that use that data flow. Each frequency must be multiplied by the percent of the time that process produces this output.

represent data flows and files, and let the rows represent data elements. A mark then shows where a data flow or file contains a specific data element. For each data element, its format and its size in characters are shown (see the lower part of Figure 11).

These two matrices, the data element matrix and the data structure matrix, have been put together by making the data flows in the columns of the data flow matrix and the data element matrix correspond. Together they form the data structure matrix of Figure 11.

Worksheet

Additional information has been added to Figure 11. For each process that is triggered externally, the figure shows what triggers the process and how often it is triggered. For each process, it is shown how long it takes from when a transaction enters the queue for that process until it is completed.

Working from the frequencies of these external triggers and how the data flows within the system trigger processes, the frequencies of all the processes can be computed. (Data flows trigger processes, but data files do not.)

Figure 12 (on ID/13) is a worksheet. The worksheet shows the number of characters in each record of a data flow or file (computed from the data structure matrix).

The total number of records of a data flow processed per day can be computed by summing the frequencies of all the processes that use that data flow. Each frequency must be multiplied by the percent of the time that process produces this output.

For example, if a process is triggered 100 times a day and the condition on the output shows it is produced 5% of the time, then this output is produced five times a day, on the average. (We might also show in the matrix whether each time the process is triggered one record or all the records of the data flow or file are processed. Here we assume only one record is processed.) The timing can be determined by critical path calculations.

The matrix can be maintained in a data base. The data base maintains the worksheet calculations. As changes are proposed, it shows the resulting changes throughout the system. It thus becomes a requirements analysis decision support tool.

About the author

Donald V. Steward is a professor in computer science at California State University, Sacramento, and a consultant. He offers in-house workshops on software engineering, office information systems and the management, scheduling and control of complex systems design.

Steward has worked in the computer field in industry for 20 years and as a professor and consultant for 10 years. He is the author of Systems Analysis and Management: Structure, Strategy and Design ***(Petrocelli Books, Inc., Princeton, N.J.) and is now writing a book on software engineering.***

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By Patricia Keefe
CW Staff

TRUMBULL, Conn. — Cannan Computer Corp. today unveiled a multiuser superminicomputer said to offer mainframe power and applications designed to run under IBM's VM/CMS operating system.

An extension of the firm's year-old Personal Mainframe Series 5000 single-user processor, the Multiuser Personal Mainframe 5800 series can support up to eight users either through a Xerox Corp. Ethernet-based local-area network or as a cluster of 5800 series terminals linked over telephone lines. The 5800 series also offers multiple windowing and the ability to run and control multiple applications simultaneously on one terminal, a spokesman said.

Available in April, the 5800 series features a two-bus architecture that includes Cannan's 32-bit central processor, which is said to execute an IBM 370 instruction set. Motorola, Inc. 68000 microprocessors are also used for I/O and communications processing, the vendor said.

The 5800 series runs on Cannan's updated, proprietary version of IBM's public-domain CMS Release 6, which provides an IBM-compatible user application interface. The user reportedly does not need an IBM mainframe or IBM's VM/CMS to run CMS applications. Users who want to be 100% compatible with IBM's systems software can purchase one IBM license per system, a spokesman said.

The Model 5823Z system console contains the 32-bit main processor, 1M byte of error-correction code (ECC) memory (expandable up to 4M bytes), an 85M-byte Winchester disk drive, the eight-port communications controller board and six Intel Corp. Multibus slots for system expansion. The system is compatible with current Cannan Personal Mainframe Series 5000 capabilities. Also supported are both data communications and data terminal equipment.

IBM 3270 support

Standard features reportedly include 8M bytes of virtual memory, an editor, a window graphics system, support for IBM 3278 Model 2 terminal emulation, a Centronics Data Computer Corp. parallel printer interface, a 1,200 bit/sec internal modem for remote diagnostics and two software packages — Cannan's proprietary kernel operating system and CMS compatibility. The latter allows the user to run CMS applications without conversion, according to the spokesman for the vendor.

Cannan expects to have 40 software packages certified for the 5800 series' April debut. After certification, Cannan and the vendor will sign marketing agreements to price the software on Cannan's systems at 5% to 10% of the license fees charged for mainframe installations.

For example, Information Builders, Inc.'s Focus costs $120,000 for a mainframe license, but only $6,500 on the Cannan system. Those packages are said to include popular data base management, decision support, business graphics and statistical analysis systems.

The Model 5823Z costs $24,900. The two software packages cost $1,850, and each Ascii terminal costs $1,500, according to the vendor. An eight-terminal configuration costs $79,250 and includes 4M bytes of ECC memory, 170M bytes of disk storage, a 1,600 bit/in. tape drive and the software. The spokesman said the 5800 series offers a per-user cost of about $10,000.

Additional information can be obtained from Cannan, which is located at 39 Lindeman Drive, Trumbull, Conn. 06611.

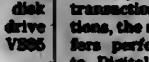
INSIDE

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Auxiliary Equipment/79

Wang adds two systems to VS85 supermini line

LOWELL, Mass. — Wang Laboratories, Inc. has announced two packaged configurations of its VS85 line of 32-bit superminis aimed at the small and medium-size office.

Featuring differing capacities of internal disk drives, the newly announced models are the VS85-76F and the VS85-147F. Both systems incorporate the same basic configuration, including: a model VS85-1 processor with 1M byte of main memory, a 16-port serial I/O processor, an archiving workstation, a bus adapter, Wang's VS operating system, assembler language, a disk I/O processor capable of supporting two disk drives, a communications I/O processor capable of supporting three data link processors and a compiler, the vendor said.



The VS85-76F includes the 76M-byte, 8-in. internal fixed disk drive currently available on the VS25 and VS45 systems. The VS85-147F has been configured with a new product, a 147M-byte, 8-in. disk drive. Each disk drive is housed in the VS85 cabinet.

The packaged VS85 systems were designed for offices that require the processing capabilities of the firm's VS100 CPU in applications supporting up to 64 users. Because the disk drives are built into the cabinets, the systems do not require special adjustments for an office environment.

Both VS85 packaged sys-

See WANG page 79

Fault-tolerant superminis offer Unix support

SAN JOSE, Calif. — Tolerant Systems, Inc. has announced the Eternity series of fault-tolerant, 32-bit superminicomputers. The systems were designed to use a version of the Unix operating system.

Designed for use in on-line transaction processing applications, the system reportedly offers performance comparable to Digital Equipment Corp.'s VAX-11/780 superminicomputer. The Eternity series consists of from one to 15 system modules called system building blocks (SBB). The SBBs are connected by a passive coaxial cable called the system interconnect bus, the vendor said.

Any SBB within the system can perform one or more distributed system tasks such as application processing, file serving or communications serving. Each SBB can contain from 1M to 16M bytes of random-access memory. Internal processors, such as a user processing unit and a real-time processing unit, are based on National Semiconductor Corp.'s NS32032 microprocessor. Each SBB contains two 32-bit processors, the vendor said.

One of the benefits of the Eternity system, the vendor claimed, is that the configuration of SBBs can be redefined to suit the application. For example, a system requiring heavy I/O traffic could focus more SBBs to file serving instead of applications processing. In addition, if more processing capacity is required, additional SBBs reportedly can

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SYSTEMS & PERIPHERALS

TERMINALS

THOMAS ENGINEERING CO.
TE-780XS; TE-780XV; TE-780XA

Thomas Engineering Co. has introduced three terminals with multihost protocols.

The TE-780XS is a stand-alone, synchronous model that emulates Honeywell, Inc.'s VIP 7800 terminals, including the VIP 7814. The TE-780XV offers an operator-selectable Digital Equipment Corp. VT100 CRT terminal personality for environments requiring both Honeywell and DEC protocols. The TE-780XA is an asynchronous model, which, when combined with a protocol converter, provides emulation of IBM's 3270 or Honeywell's VIP 7700 terminal.

All models include a 14-in., nonglare screen; a tilt-and-swivel monitor; and a detachable, low-profile sculptured keyboard. More than 60 menu-selectable setup options and an auxiliary printer port are standard.

The TE-780XA is priced at $1,695; the TE-780XS and TE-780XV are priced at $1,295.

Thomas Engineering, 1040 Oak Grove Road, Concord, Calif. 94518.

TELERAY, INC.
16GRF/APL

Teleray, Inc. has introduced a terminal that offers presentation graphics, APL capability and text editing features.

The Ansi X3.64-compatible unit, called the 16GRF/APL, has a transparent printer port through which data is transmitted. Its graphics and editing memories are independent of each other, the company said.

In the graphics mode, the terminal is compatible with the Tektronix, Inc. 4010/4014 and Plot 10. The APL mode can be accessed by entering a shift out code, the company said.

The standard 12-in. model terminal sells for $2,940. Terminals are also available in 9- and 15-in. styles.

Teleray, 6485 Flying Cloud Drive, Eden Prairie, Minn. 55344.

TANDBERG DATA, INC.
TDV 2200 price reduction

Tandberg Data, Inc. has announced a 25% price reduction for its TDV 2200 series smart terminals.

The single-unit price of the terminals has been reduced from $1,575 to $1,395. Quantity discounts are available to large users, OEMs and systems integrators, a vendor spokesman said.

Tandberg Data, P.O. Box 99, Labriola Court, Armonk, N.Y. 10504.

FALCO DATA PRODUCTS, INC.
Fame 78

Falco Data Products, Inc. has introduced a terminal designed for the IBM 3270 terminal environment.

The Fame 78 is an Ascii terminal that emulates Beehive International, Inc.'s Model 78 terminal. The vendor's terminal features a green phosphor, 24-line by 80-col. display. Other standard features include a 12-in. screen, tilt-and-swivel design, microprocessor-controlled logic board and a CRT control circuit for a separate synchronous/video CRT monitor, according to a vendor spokesman.

The Fame 78 features two RS-232C ports for host communications and local printer communication. Each port is bidirectional and offers user-selectable rates ranging from 300 to 9,600 bit/sec, the spokesman said.

The terminal is said to have an IBM 3278-type keyboard, with 24 preset function keys and special IBM status line characters. Optional features are an amber tube and a 14-in. CRT screen.

The Fame 78 with a 12-in., green phosphor screen is priced at $995.

Falco Data Products, 1366 Lawrence Station Road, Sunnyvale, Calif. 94089.

PLASMA GRAPHICS CORP.
Plasmagraphics 120

Plasma Graphics Corp. has introduced what it claims is the first full-size, flat-panel display using ac and dc plasma-discharge display technology.

The Plasmagraphics 120 is a 25-line by 80-char. display said to combine a slim profile, readability and graphics-quality resolution. It is said to provide 120,000 addressable pixels arranged in 480 col. by 250 rows.

All electronics necessary to address and time the display said to be housed on an integral panel-driver board. The display color is bright orange, according to a spokesman.

Volume production of Plasmagraphics 120 panels will begin during the second quarter of 1984. Evaluation units are available at $1,795, and the sale price per unit will begin at under $1,000, the vendor spokesman said.

Plasma Graphics, P.O. Box 4903, Warren, N.J. 07060.

MICRO-TERM, INC.
Ergo 4000 upgrade

Micro-Term, Inc. has announced an upgraded version of the Ergo 4000 word processing terminal.

The terminal's character generator has been upgraded to include 128 math and scientific characters in addition to the standard 128 Ascii characters. Also improved, according to the vendor, is the unit's character generation facility. It is clearer and more readable now, the vendor said.

Micro-Term also announced that it is offering Lexicoft, Inc.'s Spellbinder word processing package to all Ergo 4000 purchasers for $295. The upgraded Ergo 4000 costs $1,195, a spokeswoman said.

Micro-Term, 512 Rudder Road, Fenton, Mo. 63026.



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In addition, InSci offers two non-database systems. One using a sequential file structure, the other using a VSAM access method.

Personnel

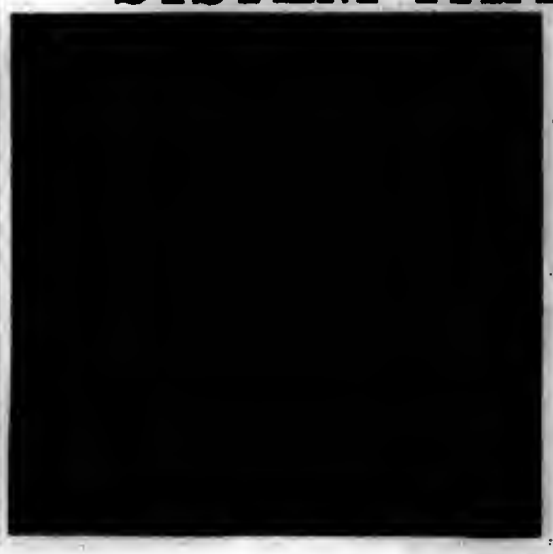
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SYSTEMS & PERIPHERALS

INNOVATIVE ELECTRONICS, INC.
IEC-80/600-3

Innovative Electronics, Inc. has introduced a protocol emulator device that reportedly allows users of Televideo Systems, Inc.'s 920, 925 or 950 terminals to emulate IBM 3277 and 3278 terminals.

The IEC-80/600-3 emulator communicates with an IBM host using 3270 binary synchronous communications protocol, according to a spokesman for the vendor. In addition, it is said to emulate a 3270 controller with one or two ports available for any combination of display stations or printers.

Other capabilities of the device include replacing or multidropping with IBM 3271 Models 1 and 2, IBM 3276 Models 1 and 2 or IBM 3274 Model 51C control units, the spokesman said.

When attached to the emulator, the Televideo terminals reportedly are driven as fully functional 3277/3278s with screen sizes of 12 by 40, 12 by 80 or 24 by 80, the company said.

The emulator reportedly provides up to 16K bytes of read-only memory, 16K bytes of random-access memory as well as three serial communications ports.

The device, with one binary synchronous communications port and a CRT or printer port, is priced at $1,495. A two-port configuration costs $1,695, according to the company.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

PRINTERS/PLOTTERS

INNOVATIVE ELECTRONICS, INC.
Innovator 300-FC

Innovative Electronics, Inc. has announced extended communications interface capability for the company's Innovator 300 line/min printer. The Innovator 302-FC reportedly provides IBM 2780/3780 emulation facilities with its built-in printer and Ascii terminal port.

Features supported include: space compression/expansion, processor interrupt reception, conversational mode, reception of Ebcdic transparent data, component selection, vertical format control and horizontal format control. Additional features of the product include: processor interrupt transmission, switch-selectable 2780/3780 modes, switched network/leased line control, auto-answer, switch-selectable Ascii/Ebcdic modes and extensive built-in diagnostics, the vendor said.

The printer system is controlled by a microprocessor-based, single-board computer system. The programmable controller is used to implement communications protocols, a vendor spokesman said. The price of the 132-column printer is $5,495.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

TELEX COMPUTER PRODUCTS, INC.
Telex 387

Telex Computer Products, Inc. has introduced a table-top matrix printer that is said to be compatible with IBM's 3287 printer.

The Telex 387 printer reportedly features 400 char./sec printing speed and complete plug compatibility for attachment to an IBM 3274/3276 terminal or Telex control unit. No system or controller changes are required to operate the Telex 387 within an IBM environment utilizing 3287 printers, a vendor spokesman said.

The 387 features a near letter-quality print option. Its standard print mechanism forms an 8- by 7-dot matrix reportedly capable of printing on up to six-part forms with a total thickness of .027 in. An optional print head mechanism with staggered wires, 16- by 14-dot matrix outputs and near letter-quality printing is available, the spokesman said.

A maximum of 136 print positions at 10 char./in and up to 233 print positions at 17.1 char./in are available.

The 387 is available now for $7,200.

Telex Computer Products, 6422 E. 41st St., Tulsa, Okla. 74135.

PRINTRONIX, INC.
MVP 150B

Printronix, Inc. has introduced the MVP 150B, a dot matrix printer designed for microcomputer networks.

The multimode printer works at a speed of 80 line/min in a letter-quality mode and 300 line/min in a dot matrix mode, the vendor said. The printer can reportedly use six-part paper with widths varying from 3 to 16 in. It supports software that expands or condenses print sizes; for example, a 132-col. report can be printed on 8½-by 11-in. paper, the vendor claimed.

The printer costs $3,745.

Printronix, 17500 Cartwright Road, P.O. Box 19559, Irvine, Calif. 92713.

POWER SUPPLIES

DATAPOWER, INC.
DPX-51

Datapower, Inc. has announced an open-frame, printed-circuit board switching power supply, the DPX-51, which reportedly has four outputs and provides up to 40W of continuous power.

The DPX-51, the vendor said, has input ranges of 90 to 132 Vac or 180 to 264 Vac that provide brownout protection and that are user-selectable. Output current levels can re-

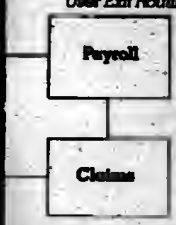
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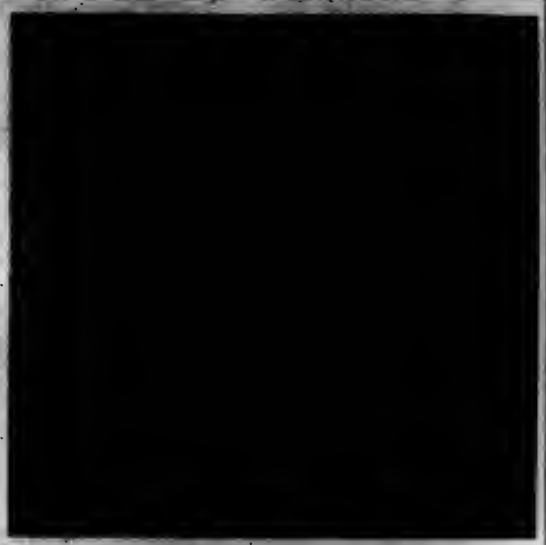
able. InSci started the HRS industry back in 1965, and we've led the field ever since. Our technical experts have provided you features unmatched by any other company.

Modularized Design For Easy Maintenance. InSci "Whole Person" software was designed from the top down and is highly modularized, providing maximum flexibility. A single module or subroutine supports each specific function in the system.

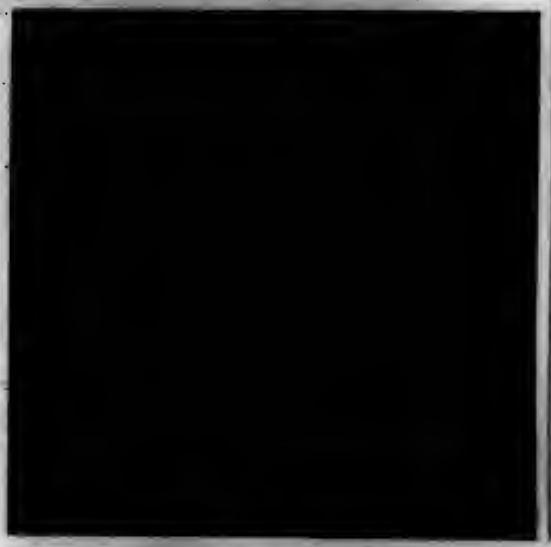
User Exit Routines. Strategic areas built into the InSci system allow exits to override the standard system routines. This means you can add your own programs without changing database system codes. InSci also gives you source codes so you can go into the system directly if you desire and still receive maintenance.

Preliminary or final processing mode. InSci systems let you select the most efficient operating mode for each processing task. All changes can be processed in real-time, so they become effective immediately. Preliminary processing allows for simulating situations such as a payroll run without affecting the database. And, of course, InSci systems provide state-of-the-art security precautions, complete maintenance support and training.





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SYSTEMS & PERIPHERALS

Continued from page 77

portably be selected by the customer, and protection is said to be provided against input surges of up to 20A.

The DPX-51 weighs 14½ lb and is priced at $40 for production-quantity orders.

Datapower, 3328 W. First St., Santa Ana, Calif. 92702.

HEWLETT-PACKARD CO.
HP 6023A; HP 6032A

Hewlett-Packard Co. has introduced two autoranging power supplies, the HP 6023A, reportedly supplying 200W in constant voltage/constant current form, and the HP 6032A, which supplies 1 kW.

The HP 6023A, according to the vendor, provides its power over a range of voltage and current, from 6.7V at 30A to 20V at 10A. The HP 6032A reportedly produces up to 50A at output voltages up to 20V. It develops no fewer than 1 kW through its 20V to 60V output range.

The HP 6032A is said to sense a low- or high-ac line or an over-temperature condition and then disable itself until the condition is remedied.

The HP 6032A is priced at $3,100. The HP 6023A is priced at $1,550.

Hewlett-Packard, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

DISPLEX, INC.
Ac line conditioner

Displex, Inc. has introduced an ac line conditioner.

According to the vendor, the conditioner furnishes sine wave outputs by providing electronic voltage regulation as well as eliminating electrical line noise, surges and spikes.

The list price is $775 for a 1-kVA unit; $875 for a 2-kVA model and $1,295 for a 3-kVA conditioner.

Displex, Alexander Place, Glen Cove, N.Y. 11542.

CONTROLLED POWER CO.
7000 series

Controlled Power Co. has announced the 7000 series of power distribution systems, said to feature power line monitoring, power conditioning and purification.

Covering a power requirement range from 10 kVA to 225 kVA, the series reportedly offers both basic and extensive power line conditioning and system operation monitoring options. Prices begin at $3,700.

Controlled Power, 1955 Stephenson Highway, Troy, Mich. 48083.

CONTROL CONCEPTS CORP.
Isiatrac

Control Concepts Corp. has announced Isiatrac, a surge suppressor designed for small computer systems.

Isiatrac constantly tracks input power, monitors transient voltages, detects disturbances, absorbs them and supplies additional power, according to a spokesman.

The surge suppressor guards against memory loss, data disturbance, improper program execution, system crashes and deterioration of system components.

Isiatrac ranges to price from $79 to $350, depending on a computer's size and configuration.

Control Concepts, 328 Water St., P.O. Box 1330, Binghamton, N.Y. 13902.

BOARD-LEVEL DEVICES

ORIGIN, INC.
OR-86RLQ

Origin, Inc. has announced a 600K-byte disk cache memory feature, the OR-86RLQ, for Digital Equipment Corp. Model RL01 and RL02 disk drives.

The disk cache board is said to double the speed of DEC Q-bus systems and cache data accessed by programs automatically. It is compatible with Unix and DEC's RSTS/E, RT11 and RSX operating systems.

The OR-86RLQ costs $3,200 in single-unit quantities and will be available in the second quarter.

Origin, 9136 Gibson St., Los Angeles, Calif. 90034.

AUXILIARY EQUIPMENT

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Reliance Electric Co. re-

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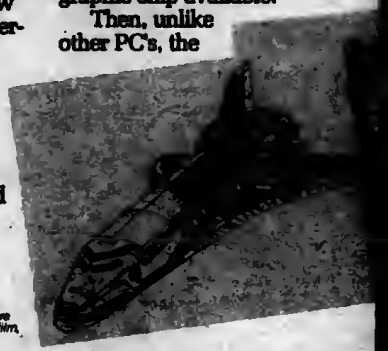
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Graphics are being used more and more by businesses every day. They give companies a clearer picture of their place in the market. They make for more effective presentations. And with slides and color transparencies, they can let a room full of people see the same thing at once. Although most people see the value of graphics, very few are aware of the personal computer that lets them create the best color graphics.

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This slide was produced from the screen using Videograph™ software, an inexpensive Screen Shooter™, and Polachrome™ 35mm film, in less than 5 minutes. For less than $1.00!

Context MBA is a trademark of Context Management Systems, Inc. Graphwriter is a trademark of Graphic Communications, Inc. Graphplan is a trademark of Chang Labs, Inc.

SYSTEMS & PERIPHERALS

cently announced the Model 45C100 Portable Intelligent CRT programmer designed to develop and maintain application programs for the company's Automate programmable controllers.

Sized to be carried as hand luggage on most airlines, the Model 45C100 was designed to be used with different Automate programmable controllers by downloading an executive program from a micro floppy disk to its main memory, a spokesman for Reliance said.

Programs may be written off-line or on-line and loaded into a programmable controller, as well as downloaded onto blank micro floppy disks to provide a convenient method of building and storing a program library, the spokesman said. The CRT interfaces to any Automate via one or two serial channels or Reliance's R-Net local-area network.

The product is priced at $5,100 and features a 9-in. diagonal screen.

Reliance Electric, 25001 Tungsten Road, Cleveland, Ohio 44117.

SPHERE TECHNOLOGY, INC. VS1000

Sphere Technology, Inc. has announced a voice entry product that operates in a workstation environment with the IBM 3274 controller and IBM 3278 or compatible display terminals.

The VS1000 is said to provide voice data entry, local user screen formatting and help center facilities. The product's voice entry is said to reduce keyboard data entry activity by enabling users to enter and access data simultaneously while performing their other job tasks.

With the VS1000, productivity improvements of 15% to 40% are possible, the vendor said. These improvements are said to be possible without IBM host programming changes.

The product communicates with 3274 and 3276 controllers and allows 3270, 3279 and 3178 CRT terminals, as well as IBM's Personal Computer or Digital Equipment Corp. VT100 CRT terminals to be used.

The VS1000 will be available for delivery, primarily to OEMs, in July, the vendor said. The single-unit price will be $7,500 with quantity discounts available.

Sphere Technology, 222 Richmond St., Providence, R.I. 02903.

WANG from page 76

tems can be configured with local and remote workstations to support a combination of DP and office automation applications. Backup devices may be added depending on individual user requirements, Wang said.

The systems cost from $70,000 for the VS85-707 and from $77,000 for the VS85-1477. They will be available in June, Wang said from One Industrial Ave., Lowell, Mass. 01851.

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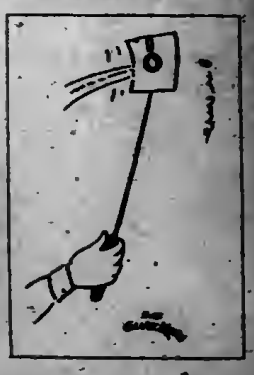
be added without taking the entire system off-line, the vendor said.

An Eternity system can handle three compatible types of storage module drive disk subsystems offering capacities from 84M to 474M bytes.

Drives can operate at an average access time of 30 msec and can achieve data transfer rates of 1.2M to 1.8M byte/sec, the vendor said.

The Eternity version of Unix is compatible with the Western Electric Corp. System V and the University of California at Berkeley Versions 4.1 and 4.2.

Designed primarily for systems integrators and value-added remarketers, an entry-level configuration costs $75,000. The vendor is located at 81 E. Daggett Drive, San Jose, Calif. 95134.



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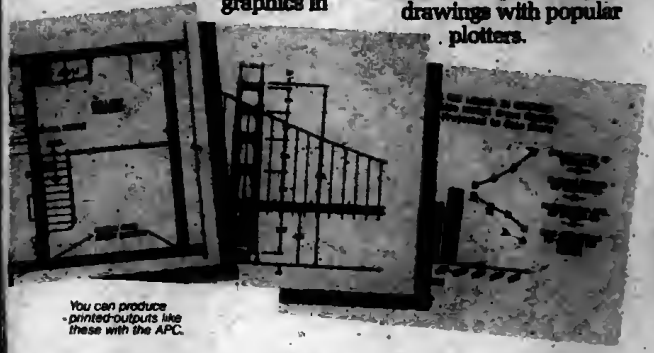
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For product literature on any of NEC's APC graphics capabilities, call 1-800-343-4419.

In Massachusetts, call 1-617-264-8635.

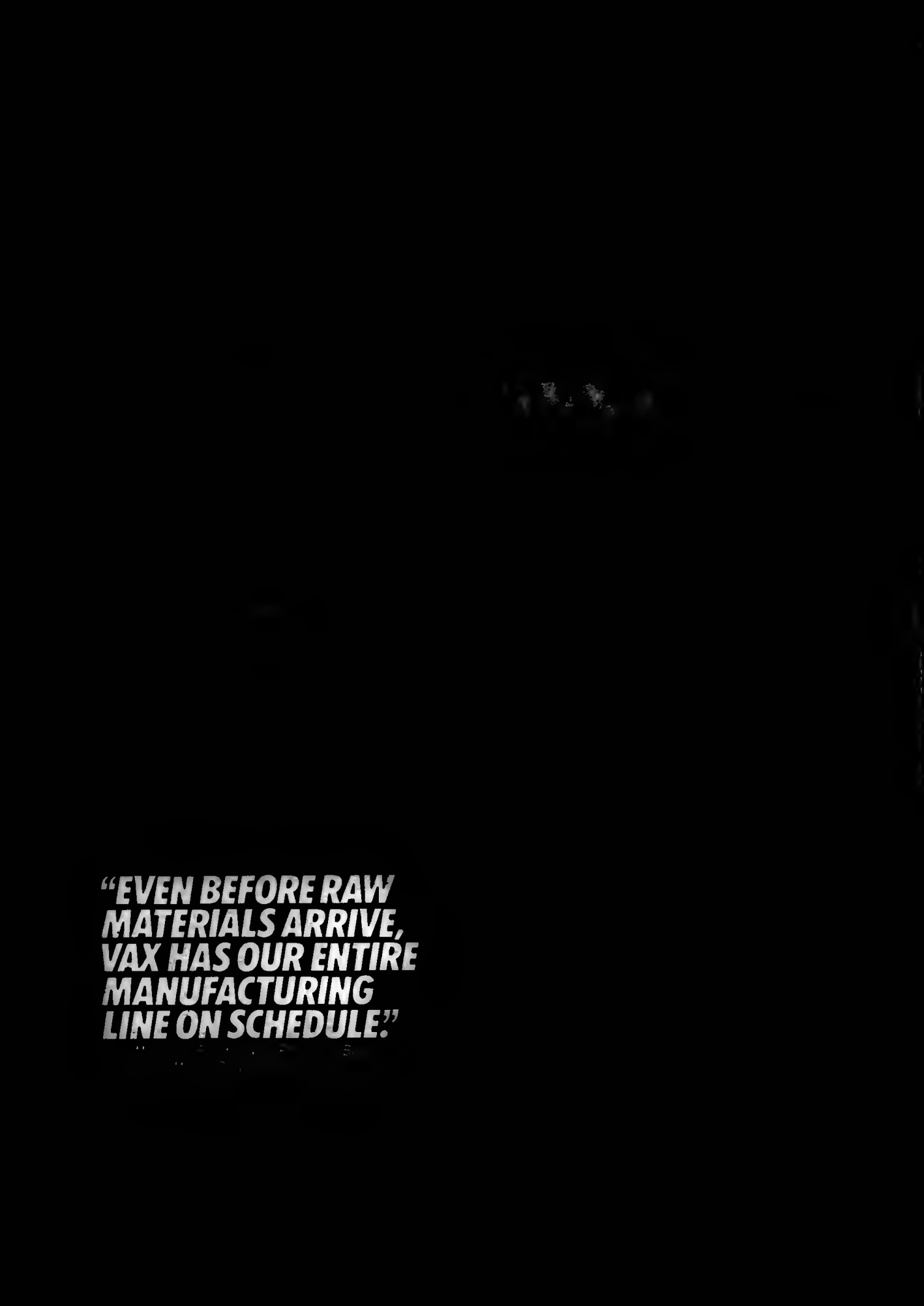
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NEC Information Systems, Inc. 1414 Mass. Ave. Boxborough, MA 01719

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MICROCOMPUTERS

MICRO BITS
Paul Gillin
CW Senior Editor

Help on the way for programmers

Considering that just three years ago they were kings of the computing hill, programmers who are interested in micro software must now be feeling like the last kid chosen for the sandlot baseball team. Vendors are falling all over each other in a Keystone Cops-like effort to court the end user, but there have been few good outlets for technical people to obtain the information they need.

Now a Dedham, Mass.-based firm is trying to capitalize on that perceived neglect. The Programmer's Shop, created last April, sells micro software almost exclusively to professional programmers. For example, in an average month the company ships about 150 C compilers as compared with seven Micropro International Corp. Wordstars and two Ashton-Tate Dbases, according to founder Bruce Lynch.

In fact, the company's promotional literature claims that sales people will politely turn away inquiries about the relative merits of certain spreadsheet software, but will cheerfully respond to an inquiry about the virtues of the same software as a programming tool.

To augment its sales business, the Programmer's Shop offers a newsletter, a software finder's service, product evaluations and comparisons, a computerized bulletin board and consultant and programmer referrals, Lynch said. Most of the services are provided at little or no charge.

The strategy has apparently been successful. From a volume of 15 shipments

See SHOP page 98

Reconciling MIS, micros

A case for the 'Personal Info Center'

By Richard Hammes
Special to CW

Early this year I got a call from a friend who is a division chief financial officer of a Fortune 500-size company. "I just came from a planning meeting where two of our managers made presentations," he said. "Both used spreadsheet programs on their personal computers to produce the numbers, and each of them came up with a completely different prediction."

My friend continued, "The problem occurred when the analysts entered the actual results into their models by copying data from printouts — one used a week-old report, the other used a revised report he got that day. To make it worse, there were at least two data entry errors in the copying. Maybe the only real solution to problems like this is to take away all the personal computers and software used in our organization."

"No, I don't agree," I told him. "Your story isn't an argument against using personal computers; it's proof that they haven't been used enough."

This situation is typical in many companies. The most common problem new personal computer users have encountered is that while they may be using the same spreadsheets, they are not necessarily working with the same data.

We recently surveyed MIS directors at 30 of the largest corporate computer users in the U.S. Seventy percent of the companies we talked to said they were involved with information centers and that they felt these efforts were important and well-accepted in their organizations.

But when we talked to the same companies about personal computers, we came up with a different picture. Very few formal plans had been laid out. More importantly, we believe the MIS managers dramatically underestimated the number of personal computers in use in their companies. If we totaled up answers from 30 of the largest companies in the U.S., we came up with about 8,000 personal computers. Estimates vary, but the consensus is that there are at least 500,000 personal computers installed in the top 1,000 companies.

We have discovered that the information center user tends to be very computer-literate. Personal computer users, on the other hand, tend to be managers, analysts or other professionals whose personal computers are adjuncts to their jobs.

Through the information center, MIS has been able to deliver information to more people than ever before. However, most of the personal computer group members in our study were "Visicalcing" away, without MIS sponsorship. The end users

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Leading Edge recalls micros

NEEDHAM, Mass. — Leading Edge Products, Inc. has recalled the first 1,170 units of its personal computer that were sent to dealers prior to Feb. 3.

According to a company spokesman, the power supplies in the CPU may be defective and continued use may be dangerous.

The CPU unit of Leading Edge Products' personal computer, manufactured by Mitsubishi Electric Co. and bearing an Underwriters Laboratories, Inc. approval, has not caused any problems yet, the company said.

Dealers and end users are asked to stop use of the system immediately. Each power supply will be replaced by Leading Edge soon, a spokesman said from 225 Turnpike St., Canton, Mass. 02021.

Sanyo's MBC 5500 tops Auerbach's spreadsheet survey

By Paul Gillin
CW Staff

PENNSAUKEN, N.J. — If you plan to make spreadsheet your principal microcomputer application, you might check out the Sanyo Business Systems Corp. MBC 5500 computer. Auerbach Publishers, Inc. has named it the No. 1 micro system configuration for spreadsheets.

Auerbach's Microcomputer Ratings on spreadsheet applications assigned the Sanyo MBC 5500 a quality rating of 12.54 points, based on capabilities and price. In contrast, the IBM Personal Computer finished in 30th place with a quality rating of 7.40. In all, the Sanyo micro captured three of the top 10 spots for spreadsheet applications [see related chart].

The survey evaluated 119 microcomputers and rated them in order of the best spreadsheet capability per dollar spent. While the Sanyo MBC 550 does not offer the most elegant features, its price of $1,795 for a configuration including 128K bytes of memory, Microsoft, Inc.'s MS-DOS operating system, a CRT monitor, 14 char./sec printer and three bundled software packages makes it a best buy, the report stated.

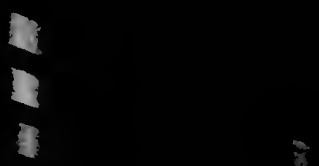
The Auerbach ratings were based on a recommended spreadsheet configuration that includes 64K bytes of memory, a single diskette drive, 80-col. upper/lowercase display with at least 20 lines of text displayed and a dot matrix printer. Generic components were added when not supplied by the vendor to satisfy the recommended configuration requirements, the survey stated.

The relative capabilities of each component in the system were measured using standard quality point ratings, and prices for the required components were included in the rating formula.

Based on those criteria, the five lowest rated systems included Charles River Data Systems, Inc.'s Universe 68/47, Burroughs Corp.'s B20 Series Model 22, Perq Computer's Perq, Cado Systems Corp.'s Zigar ATS 64 and Diglocomp Research Corp.'s Delphi-100. However, price was the major mitigating factor in systems of the lowest rated group, most of which were designed for more complex applications.

Extra quality points were awarded for systems handling larger word sizes, larger disk and memory capacities, CRT monitor resolution, printer capabilities, communications and I/O ports, capability to support multiple operating systems, inclusion of bundled software and price. Fifty percent of the systems evaluated were single station/single task, while 30.4% were multiple station/multiple task. Forty-four percent were 8-bit machines.

Auerbach's microcomputer ratings are available for $14.95 each or three for $35 from 6560 N. Park Drive, Pennsauken, N.J. 08109.



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So the chances are pretty good that your own programming effort can be trimmed substantially. When you do need to write your own programs, the HP 3000 will help you do it much faster. With our special set of programming tools, customers have cut 500 lines of code down to 100. At about $50 a line, that really adds up.

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If you'd like to see how useful an HP 3000 can be, call your nearest HP sales office listed in the white pages. Ask a Business Computer Specialist for a demonstration. Or write for more information to Tom Rappath, Hewlett-Packard, Dept. 03184, 19447 Pruneridge Avenue, Cupertino, CA 95014. In Europe, write to Henk van Lammeren, Hewlett-Packard Nederland B.V., Dept. 03184, P.O. Box 529, 1180 AM, Amstelveen, The Netherlands.

HEWLETT PACKARD

BD03511

IBM micro group considering going national

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — A users group that caters to owners of IBM micros is strongly considering the idea of making the transition from a regional to a nationwide organization. To date, the IBM Users Group, Inc. has strictly confined its base of operations to Southern California.

"We've received a number of inquiries from people in other parts of the country," according to the group's president, Neil Zachary. "We're not really pushing [the idea], but we're not opposing it either."

During its infancy, the users group consisted of only one chapter, which was located here and served the whole Greater Los Angeles area.

Then, within the last few months, the organization formed two additional chapters — one each in the neighboring communities of Pasadena and Laguna. The members organized their own chapter and now meet locally.

In Laguna, meanwhile, a second group of users also expressed an interest in forming their own chapter. "But they didn't want to be bothered with a lot of organizational work," Zachary said, and thus approached the existing Los Angeles chapter with an appeal for help in getting started.

Now the users group may be poised for yet another expansion that would include the entire continental U.S.

Many of the group's member services, including the production of its monthly newsletter and the selection of featured speakers for local chapter meetings, are furnished centrally by the original Los Angeles organization.

Benefits whole group

The recent formation of the Pasadena and Laguna chapters has benefited the users group as a whole, Zachary said.

It provides additional sources of information for the monthly newsletter, enlarges the organization's existing library of software in the public domain, strengthens the group's ability to attract name speakers and creates additional opportunities for the exchange of useful information.

Moreover, the addition of two extra chapters greatly increases the chances for face-to-face interactions among group members. "Space permitting, a member of one chapter is free to attend the meetings of any other chapter," Zachary said.

Each of the group's three constituent local organizations has its own characteristic outlook, composition and personality.

The original Los Angeles chapter, for example, boasts the widest diversity of members, with a smattering of technical people and professionals as well as a large contingent of business-oriented employees from large corporations, Zachary said.

The Pasadena chapter, by contrast, is composed primarily of technical users, while the Laguna organization is dominated by computing novices, he added.

More information about the IBM Users Group can be obtained from Zachary at P.O. Box 4136, Los Angeles, Calif. 90078.



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Vector Graphic announces business microcomputer

THOUSAND OAKS, Calif. — Vector Graphic, Inc. has announced a business microcomputer with memory expansion of up to 896K bytes and support for three operating systems. The Vector SX is almost twice as fast as previous Vector systems, a spokesman said.

The Vector SX employs an 8-bit Zilog, Inc. Z80 processor in addition to a 16-bit Intel Corp. 8086.

The standard operating system is Digital Research, Inc.'s CP/M 86, with a simulator that allows Digital Research CP/M applications to be run as well.

Microsoft, Inc.'s MS-DOS 2.1 operating system is optional and can co-reside with CP/M 86 on a hard disk. Digital Research's Concurrent CP/M 86 will be available in May, the spokesman said.

IBM-compatible, soft-sectored floppy disk drives and related software allow the Vector SX to read disks from a variety of manufacturers, the spokesman said.

The system also incorporates an intelligent detached keyboard, high resolution, monochrome graphics display, 32K bytes of video random-access memory (RAM), three expansion slots, a tone generator, one serial printer port, two parallel printer ports and an RS-232 communications port, according to the spokesman.

A Vector SX with a 737K-byte floppy drive and 10M-byte hard disk is priced at $6,294, including monitor. Other 128K-byte RAM systems range from $4,295 to $9,995.

Vector Graphic is located at 500 N. Ventura Park Road, Thousand Oaks, Calif. 91320.

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Wang offers OIS 60 processor

LOWELL, Mass. — Wang Laboratories, Inc. has introduced the OIS 60, a clustered information processor for small and medium-size businesses.

The processor has 33.5M bytes of fixed disk memory supporting up to eight users and five peripheral devices. Standard software includes the company's word processing with advanced functions, decision processing, a sort utility for performing an alphanumeric sort on records, math support and system security. A message control function is also standard, a company spokesman said.

Information processing on the OIS 60 can be optimized through the use of Wang Systems Networking (WSN). Included in WSN is Wang Office, which provides several information management functions within a network including electronic mail, time management, user directories and file management capabilities.

The OIS 60 master, which includes word processing, utilities and advanced functions system software, costs $9,000, Wang Laboratories said from One Industrial Ave., Lowell, Mass. 01851.

SYSTEMS

**PERTEC COMPUTER CORP.
4210**

Pertec Computer Corp. has introduced a low-end model, the 4210, to its Pick operating system-based Sabre family of computers.

The 4210 includes 256K bytes of memory, a 10M-byte Winchester hard disk, four serial ports and an 800K-byte floppy disk. It can reportedly be field-upgraded to the vendor's 4220 model, which includes 1M byte of memory and 80M bytes of Winchester disk storage.

The 4210 retails for $9,400.

Pertec, 17112 Armstrong Ave., Irvine, Calif. 92713.

MICROCOMPUTERS

DBS INTERNATIONAL; INC.
DBS 16 enhancements

DBS International, Inc. has enhanced its DBS 16 multiuser, supermicrocomputer system so that it supports 28 users.

The system features Intel Corp. 80186 microprocessors; 256K bytes of random-access memory (RAM), expandable to 3.58M bytes of RAM; and storage capacity from 720K bytes to 40M bytes, the vendor said. An optional 20M-byte cartridge tape drive is available, according to the vendor.

The system uses Digital Research Inc.'s MP/M 86 operating system; Digital Research's Concurrent CP/M is an available option. DBS International's DBS-Net links the microcomputers. Prices range from $4,190 to $39,000.

DBS International, Welsh Road and Park Drive, P.O. Box 425, Montgomeryville, Pa. 18936.

AES Data Corp.
AES Savin 7100; AES Savin 7200

The AES Data Corp. has introduced an office workstation, which can reportedly act as a stand-alone word processor, and a word processor with the personal computer capability to support multiple work stations.

The workstation, the AES Savin 7100, can reportedly be used for both word and data processing and supports Digital Research, Inc.'s CP/M 2.2 operating system. Its basic configuration includes 128K bytes of memory, a letter-quality printer, detached keyboard, 12-in.-screen terminal, two disk drives and software for $6,495.

The AES Savin 7200, is a multifunction, shared-logic word processor that uses modular software elements. A four-screen configuration, including one CPU, using both 12- and 16-bit processors, a 10M-byte rigid disk drive and one 45 char./sec letter-quality printer, costs just under $30,000.

The Savin 7200 supports Digital Research's CP/M 86 operating system in addition to the AES proprietary operating system.

AES Data, P. O. Box 10272, 9 W. Broad St., Stamford, Conn. 06904.

DOUBLE GOLD SOFTWARE, INC.
Lock-it-up

Double Gold Software, Inc. has introduced its Lock-it-up copy protection systems for the IBM Personal Computer and compatibles.

According to the vendor, the Lock-it-up system is a menu-driven diskette copy protection and duplication utility featuring several levels of protection for standard diskettes.

The IBM version of the product protects versions that run under IBM's PC-DOS. The protection takes 6K bytes of memory and will work with up to three dual-sided drives.

System requirements include 128K bytes of memory, two or more 40-track disk drives and IBM's PC-DOS operating system. The IBM version of the product costs $495.

Double Gold Software, Suite 29, 3900 Moorpark Ave., San Jose, Calif. 95117.

COLBY COMPUTER
Colby PC-3

Colby Computer has announced Colby PC-3, a transportable microcomputer that is compatible with the IBM Personal Computer.

Colby PC-3 weighs 26 lb, uses an Intel Corp. 8088 microprocessor and has a 9-in. amber screen and two double-sided, double-density disk drives. The unit features 128K bytes of random-access memory, expandable to 1M byte, a real-time clock, serial port and parallel port. It costs $2,795.

Colby Computer, 849 Independence Ave., Mountain View, Calif. 94043.

STORAGE

ACKNOWLEDGE, INC.
AT-1600-PC

Acknowledge, Inc. has introduced a tape backup system designed specifically for the Wang Laboratories, Inc. Professional Computer.

According to the vendor, the AT-1600-PC, a 17.5M-byte system, is file-oriented, allowing users to back up and recover selectively any data they need in the order they want. The 4-track, 6.4K bit/in. serial cartridge drive can handle 17.5M bytes of data per 555 feet of tape.

The unit reportedly is driven by an intelligent interface card that takes up a single slot in the Wang Personal Computer.

The system costs $2,995, which includes controller, cables, tape drive, cabinet, power supply, software, documentation, installation and a one-year warranty.

Acknowledge, 55 Union Ave., Sudbury, Mass. 01776.

ZETRATEC CORP.
Zeke

Zetratec Corp. has unveiled an intelligent subsystem that can be used as a backup for Winchester drives or as a stand-alone unit for small business and personal computers.

Zeke reportedly offers the user full random data accessibility with up to 28M bytes of high-density storage on one cartridge tape. It is compatible with the IBM Personal Computer and Personal Computer/XT. Zeke is plug-compatible with industry-standard interfacing and functions with most regular or mini floppy disk controllers, the vendor said.

The product is priced at $1,995.

Zetratec, 1625 Olympic Blvd., Santa Monica, Calif. 90404.

See STORAGE page 92

Finally a CICS query system that's as easy for the DP department as it is for the end user.

Introducing ExecuTrieve.

From the perspective of the DP professional, ExecuTrieve represents a dramatic breakthrough in query system efficiency.

No disruption. ExecuTrieve operates with your existing files in your CICS environment. It doesn't require costly system changes or any additional programming.

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MICROCOMPUTERS

STORAGE from page 91

PERTEC COMPUTER CORP.
Magnetic tape option

Pertec Computer Corp. has introduced a ½-in. magnetic tape drive for use with its Pick & Associates, Inc. Pick operating system-based Sabre Model 4240 multiuser system.

The drive comes with an intelligent controller, reportedly allowing virtually any ½-in. tape using the Pertec interface to be run.

The tape drive is priced at $6,000.

Pertec, 17115 Armstrong Ave., Irvine, Calif. 92713.

PRINTERS/ PLOTTERS/ PERIPHERALS

IMAGE RESOURCE CORP.
Samurai CFR Model 9

Image Resource Corp. has introduced the Samurai CFR Model 9, a business presentation color graphics system that produces color slides from an IBM Personal Computer, Personal Computer XT, Personal Computer XT/370 or 3270 Personal Computer.

The Samurai is a stand-alone film recorder and graphics processor circuit board that plugs into one of the Personal Computer expansion slots.

According to the vendor, Samurai uses a proprietary continuous writing technology instead of the discrete pixel format of most graphics screens. As a result, there are no ragged edges on graphics elements, the company claimed.

Dual 5¼-in., flexible disk drives and 192K bytes of memory are required.

The Samurai is priced at under $10,000 for the hardware interface, graphics utility software and desktop film recorder.

Image Resource, 733 Lakefield Road, Westlake Village, Calif. 91361.

ENVISION TECHNOLOGY, INC.
Vectorprinter

Envision Technology, Inc. has introduced Vectorprinter, a color text and graphics printer, enhanced to emulate printers and pen plotters compatible with the IBM Personal Computer and Personal Computer XT.

Vectorprinter's capabilities allow business and technical professionals to do word processing and graphics at one workstation, a spokesman said.

Envision has enhanced Vectorprinter to emulate the Diablo Systems, Inc. 630 family of printers, enabling it to run a variety of word processing systems.

The price of Vectorprinter is $3,495 in single-unit quantities, with volume discounts available.

Envision, 631 River Oaks Pkwy., San Jose, Calif. 95134.

BOARD-LEVEL DEVICES

MICROPHONICS TECHNOLOGY CORP.
Oto-1

Microphonics Technology Corp. has introduced Oto-1, a speech recognition system that can convert Microsoft, Inc. MS-DOS software packages to speech input for both menu commands and data entry.

The system consists of a single circuit board that plugs into any auxiliary slot in an IBM Personal Computer, Personal Computer XT or IBM-compatible computer. According to the vendor, a proprietary firmware and software combination provides a transparent interface with the applications program, allowing voice input to be used interactively with a keyboard or another data entry device.

The system includes 16K bytes of random-access memory, expandable to 64K bytes; a 128-word, on-board vocabulary; and better than 98% word recognition accuracy, the company said.

Oto-1 is priced at $795.

Microphonics Technology, P.O. Box 7411, Federal Way, Wash. 98003.

PARADISE SYSTEMS, INC.
Paradise multidisplay card

Paradise Systems, Inc. has introduced the Paradise multidisplay card for the IBM Personal Computer, Personal Computer XT and compatibles.

According to the vendor, the display card provides the user with a color display controller, monochrome display controller and printer interface, all on a single board.

The card is compatible with all IBM Personal Computer software and has the capability to support Lotus Development Corp.'s Lotus 1-2-3 using two displays.

The multidisplay card sells for $595.

Paradise Systems, 150 M. Hill Drive, Brisbane, Calif. 94005.

AUXILIARY EQUIPMENT

PARA SYSTEMS
Minuteman

Para Systems has introduced an uninterruptible power supply model that provides standby emergency power and voltage regulation for most microcomputers, disk drives and word processors.

The Minuteman is rated at 250W, the vendor said, but will safely handle some microcomputers with higher rated power, including the IBM Personal Computer XT.

When power interruptions occur, the Minuteman switches from ac power to its own emergency battery power for up to 15 minutes.

The Minuteman is priced at $435.

Para Systems, Suite 404, 11425 Mathis St., Dallas, Texas 75234.

CEAG ELECTRIC CORP.
Model COM3000

Ceag Electric Corp. has introduced the Model COM3000 triple-output power supply designed for microcomputers.

The 80W switching regulator uses a high-reliability flyback converter topology with filtered outputs and transistor-to-transistor logic. According to the vendor, each unit has overvoltage protection, is open-circuit- and short-circuit-proof and meets Federal Communications Commission requirements.

The price is $114 for each COM3000 in quantities of 100.

Ceag Electric, 1334 Motor Pkwy., Hauppauge, N.Y. 11788.

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And because it's all one program, you not only work faster and smoother, you work smarter.

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Take the word of the experts. *The New York Times* heralded 1-2-3 as "the wave of the future in business software." And recently they wrote, "In scarcely a year, the Lotus Development Corporation has done for the world of personal computer software what International Business Machines has done for personal computers: it has created a product so wildly successful that scores of other companies are scrambling to imitate or improve on it."

Software News said, "1-2-3 has more capabilities than any other program in its class."

"It is the one product that without doubt has single-handedly changed the face and direction of the personal-computer-software industry," was the way *Info-World* put it.

Softalk simply wrote, "Lotus's 1-2-3 is so dominant, it doesn't seem as though there's room for other software." And in 1983, 1-2-3 from Lotus was good enough to be named a "Product of the Year" by both *Fortune* and *Info-World*.

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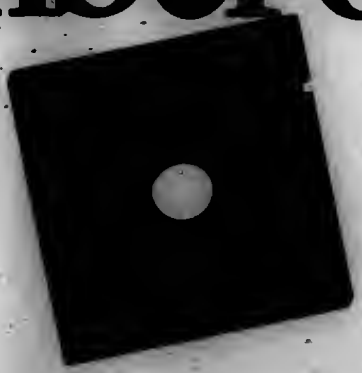
To find out what 1-2-3 from Lotus can do for you just visit your local computer store, or call 1-800-343-5414. (In Massachusetts call 617-492-7870.)

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MICROCOMPUTERS

SOFTWARE

HEWLETT-PACKARD CO.
Lotus 1-2-3, Context MBA for HP 150; Financial Calculator

Hewlett-Packard Co. has announced that Lotus Development Corp.'s Lotus 1-2-3 and Context Management Systems, Inc.'s Context MBA are available for its HP 150 touch-screen personal computer.

The vendor has also introduced its own Financial Calculator, which turns the HP 150 screen into an HP 12C financial calculator. All the features and programming capabilities of the Financial Calculator can be used with the HP 150.

The Lotus 1-2-3 is priced at $500, Context MBA is $695 and the Financial Calculator is priced at $75.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

STSC, INC.
APL-Plus/PC

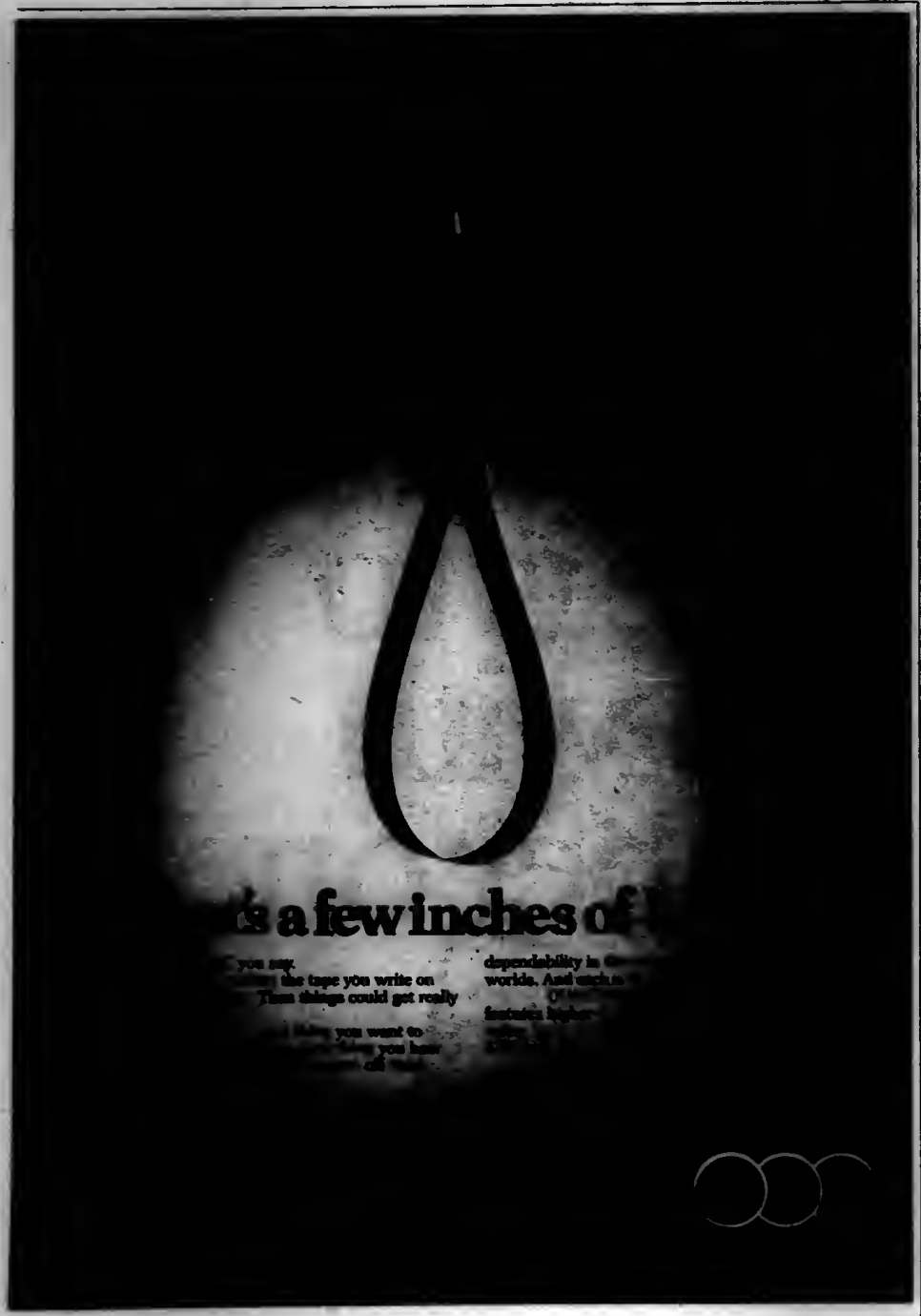
STSC, Inc. has introduced a financial and statistical package containing more than 200 programs for the IBM Personal Computer and other compatible machines.

The APL-Plus/PC financial and statistical library includes routines to perform financial calculations, forecast time series and compute statistical measures. Programs include six different types of depreciation, more than 20 types of rate of return, 10 types of forecasting and 25 probability distributions, the company said.

It runs under IBM's PC-DOS on the IBM Personal Computer or Personal Computer XT, the Compaq Computer Corp. Compaq and compatibles.

It is priced at $275.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.



DIGITAL EQUIPMENT CORP.
Protocall 350, 1000

Digital Equipment Corp. has introduced Protocall 350 and Protocall 1000, two software applications that use the telephone management system hardware option for the Professional 350 computer.

Protocall 350 allows telephone users to replace a number of functions of a desk telephone and all telephone and address reference files, such as business card files, personal phone directories and calling calendars. It automatically places phone calls using the telephone management system.

Protocall 1000 includes all the features of the 350 and also expands the smart directory functions into a personal data base system, the company said.

Protocall 350 costs $195; Protocall 1000 is priced at $395.

DEC, 146 Main St., Maynard, Mass. 01754.

APPLIED BUSINESS TECHNOLOGY CORP.
Project Manager Workbench

Applied Business Technology Corp. has introduced the Project Manager Workbench (PMW), a software package designed as a decision support system for the project manager.

System requirements are an IBM Personal Computer or Personal Computer XT with one disk drive and 256K bytes of memory. According to the vendor, the PMW integrates Gantt charts, networks and resource allocation spreadsheets.

Data entry is done by cursor control to reconfigure a plan and cut-and-paste activities across multiple projects; an optional expert mode is also featured with single keystroke commands.

The product is priced at $750.

Applied Business Technology, 76 Laight St., N.Y., N.Y. 10013.

FOX RESEARCH, INC.
Forms Manager

Fox Research, Inc. has announced an enhancement to its 10-Base relational data base management system said to permit users to format and compose documents from information stored on their IBM Personal Computer, Personal Computer XT and compatible microcomputers.

The enhancement, called Forms Manager, reportedly allows 10-Base users to create documents of any length, unrestrained by the size of their screens. It also permits forms to be filled in automatically with data drawn from the user's data base files, the vendor said.

10-Base, including Forms

MICROCOMPUTERS

Manager, costs $495 and runs on the IBM PC-DOS 2.0 or Microsoft, Inc. MS-DOS 2.0 operating systems. Existing 10-Base users may acquire the enhancement for $15.

Fox Research, 7005 Corporate Way, Dayton, Ohio 45459.

DATAMENSION CORP. Report Manager 3-D enhancements

Datamension Corp. has enhanced Report Manager 3-D, a three-dimensional spreadsheet that runs on the IBM Personal Computer.

One enhancement that works with communications software allows a user to cut and paste information from any microcomputer, minicomputer or mainframe, according to the vendor. Other improvements include support of color monitors, key word search, expanded local and global formats and nested sorting capability, the vendor said.

Report Manager is priced at $495, the vendor said.

Datamension, 615 Academy Drive, Northbrook, Ill. 60062.

See SOFTWARE page 98

USE from page 83

were getting the micro-based tools they wanted, but they wanted access to the corporate data bases, too.

The information center and the personal computer are both incomplete solutions. The information center is controlled, secure and elitist, and the personal computer is spreading wildly.. Information center growth is limited by tight coupling to mainframes. Micro users are stymied by the unavailability of information from corporate data bases.

These two worlds must be brought together into a better concept called the Personal Information Center. The Personal Information Center gives users the choice between using personal reporting systems on IBM 3270-type terminals and using personal computers with direct access to corporate data bases. It must be under the control of MIS because data base access must be protected by a high level of security. MIS also must control priorities on the mainframe.

The coming of the Personal Information Center has been accelerated by some important product announcements. On the hardware side, the IBM 3270-PC physically combines the 3278 and 3279 terminals and the IBM Personal Computer in one box. It offers application developers the opportunity to build more friendly applications. It does not, however, offer direct downloading from data bases to personal computer applications. For that capability, MIS directors will have to turn to software companies.

As the Personal Information Center evolves, we think it will display a number of characteristics:

- Hardware and software will be engineered for strategic use. MIS will reject hot products which can't demonstrate staying power, extensibility and high quality.
- Data base access will be well-secured but also timely and available to all qualified users, whether from a personal computer or terminal.
- Mainframe software will be able to extract data from all pertinent data bases while allowing users to select only the data they need. Users will not have to download entire files when they only want selected records from these files.
- Personal computer users will insist on extraction software that works naturally and automatically with their favorite micro programs.

It's been almost a year since my friend's call. During that time a lot has happened, including a series of meetings he's had with his division MIS director. My friend hasn't thrown away his calculator and 13-column pads. He's now working with MIS to develop a Personal Information Center, and the two analysts will be among the center's first users.

Hannes is vice-president of the New Business Division within the Software Products Group of Informatics General Corp.

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SOFTWARE from page 97

SAMNA CORP.
Samna Word III

Samna Corp. has enhanced Samna Word, a word processing package that runs under Microsoft, Inc.'s MS-DOS operating system.

Features of Samna Word III include glossaries, user-defined function keys, five mathematical functions and a spelling checker. The package includes automatic indexing, section numbering, table of contents generation, keyboard-to-printer typing and support of tree-structured file directories, the vendor said.

Samna Word III costs $650.

Samna, Suite C-1200, 2700 N.E. Expwy., Atlanta, Ga. 30345.

MICRO FOCUS, INC.
Level II Cobol compiler; Animator; Forms-2

Micro Focus, Inc. has announced that IBM will market several Micro Focus programs for use with the IBM 3270 Personal Computer. They include Level II Cobol compiler and native code generator, Animator debugger and Forms-2 source code generator.

According to a spokesman, the Level II Cobol compiler is the only General Services Administration-certified high-level Cobol for micros.

Animator is available for $800, Forms-2 for $400, Level II Cobol for $1,600, all from IBM representatives.

Micro Focus, Suite 400, 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

GRYPHON MICROPRODUCTS
Dbelper Part 1

Gryphon Microproducts has introduced Dbelper Part 1, a utility that assists in the writing of Ashton-Tate Dbase code. The new program reportedly allows users to set listing parameters, do macro substitution and, using the program's syntax checker, conduct error accounting.

The program also is said to produce a cross-referenced and alphabetized data dictionary of variables, keywords, constants and files. It also allows users to merge multiple procedures into a single procedure requiring no editing to run.

The program is available from the vendor for $150.

Gryphon Microproducts, P.O. Box 6543, Silver Spring, Md. 20906.



SHOP from page 83

the first month, the company now mails out about 30 packages per day, according to Lynch. About 80% of The Programmer's Shop's customers are divided evenly between commercial software developers and programmers in Fortune 1,000 companies, with consultants making up the difference. Previously, many of those clients had worked through high-volume mail-order houses or directly with manufacturers to obtain software like linkers, compilers, editors and debuggers. The Programmer's Shop maintains a stock of about 80 products and claims to have ready access to 300 more.

Of equal importance to many users are the firm's evaluation criteria. About 70% of the inquiries that come into The Programmer's Shop ask for product literature, which the retailer sends out in abundance. Customers who call the company offices can get a critical evaluation of various packages, although the evaluations are not made publicly available, Lynch said. The Programmer's Shop also maintains a list of products it has found to be "real junk," he said.

The firm is now trying to establish an information-sharing network for customers. Users typically contribute ideas and opinions to the electronic bulletin board and newsletter, and Lynch is working to put together a compendium of benchmark results submitted by customers. The results will be distributed free on diskette to anyone who contributes, he said.

The concept of this kind of specialization has apparently succeeded because programmers have a much greater stake in the quality of the software they buy, Lynch said. "A typical micro programmer might use his micro six hours a day or more," he noted, "whereas someone using Wordstar might use his machine for a half-hour."

Customers seem to concur that the clearinghouse is worthwhile. "I basically don't buy from anybody unless I buy from them," said Peter Norman, a consultant with Project Technology, Inc. in Cambridge, Mass., who said he has bought nearly 100 packages from the company. "We get a pretty good discount, and they also know something about software. They're by no means perfect, but they're so much better than anybody else."

Another customer agreed. "They're probably one of the best software vendors we've found," said Ray Ostolski, manager of Engineering Management Systems in the Apparatus and Engineering Services Operation at General Electric Co. in Schenectady, N.Y.

The Programmer's Shop uses a method to evaluate software without actually plugging it into a machine, Lynch said. Potential suppliers fill out a form detailing their experience, special features, documentation and other information. Lynch said he can scan the sheet and make a preliminary evaluation "in about 30 seconds." Technical specifics, he said, are the key.

"Products usually deliver to technical claims, but not to marketing claims," he said. "In order to get a good idea, I eliminate everything except the market leader. Then I compare everything else with that."

The Programmer's Shop is located at 908 Providence Highway, Dedham, Mass. 02026.

COMPUTER INDUSTRY

INDUSTRY INSIGHT
Peter Bernstein
CW Senior Editor

Fujitsu: answer to PCM prayers?

If you like coincidences, then you just had to get a kick out of the two Amdahl Corp.-related announcements a week and a half ago. The same day Amdahl announced two 6000 series disk drives to compete with IBM's 3380 product, it was announced Fujitsu Ltd. had boosted its ownership in Amdahl to just under 50%.

The disk drives announced by Amdahl, the Models AA4 and B4, are both reportedly manufactured by Fujitsu, and the betting is that before too long all Amdahl products will be value-added versions of Fujitsu products.

"Fujitsu has done reasonably well manufacturing disk drives on an OEM basis," Dale Kutnick, executive director of The Yankee Group, said following the Fujitsu stock announcement: "There is an opportunity there, particularly with the decline of the U.S. disk makers . . . if Fujitsu can get its act together."

The effective takeover could provide a much-needed spark to the entire plug-compatible market. Fujitsu has an array of products spanning the whole spectrum of information processing requirements, from personal computers to supercomputers. It also has reported revenues in the $4 billion range, a very healthy position from which to twitch the nose of IBM. Certainly, Fujitsu appears to have potential staying power that others in the field lack.

Computer industry analyst Bill Easterbrook, of the investment firm of Kidder Peabody and Co., Inc., noted, "Fujitsu has financial resources and

See FUJITSU page 116

'Simple' maker files Chapter 7

Facing $4 million debt

By Paul Korzeniowski
CW Staff

LEXINGTON, Mass. — The worst fears of 49 employees of Data Concepts International, Inc. were realized March 5 when Thorpe Wright, company president, announced the company was filing for liquidation under Chapter 7 of the Federal Bankruptcy Act.

Faced with approximately $4 million of debt, hounded by 154 creditors and unable to attract sufficient capital to continue operations, the company turned over to the court its assets, including Simple, an application generator for Motorola, Inc. 68000-based systems.

Founded in 1975 by Wright, Calvin Moore and Andrew Diamond, Data Concepts, Inc. began developing a programming language and an application generator. "Initially, we had $10,000 to finance the company," Wright said.

In early 1982 with Trace, the programming language, and Simple, the application generator, completed, the company attracted $1 million in venture capital and changed its name to Data Concepts International.

"To demonstrate the application generator's power, the company chose to market the product to insurance companies and develop commercial line systems," according to a former employee, who asked not to be named.

Commercial lines represented the last principally manual insurance application. Software for the task had to be flexible enough to use a series of complicated tables and rates, while providing an on-line data base and real-time updating.

Data Concepts approached a number of insurance companies and offered them, at a fixed cost, a custom-designed commercial line system. But contract specifications did not define the system. "The company gave the users carte blanche reign," the former employee said. "Whatever they

See BANKRUPT page 114

IBM, AT&T seen squaring off

By John Dix
CW Staff

NEW YORK — Battle lines are being drawn between titans AT&T and IBM, and the imminent confrontation will be waged for the most part in the automated office.

That was the message delivered at a Gartner Group conference, titled "AT&T and IBM: The Battle Begins," held here last week. The two-day conference examined the perceived strengths and weaknesses of the two companies, as well as the markets in which they are likely to butt heads.

AT&T, it is believed, will try to leverage its dominance in the communications industry to enter the markets for computing and office systems equipment.

According to Stephen P. Cohen, vice-president and director of Gartner's Industry Service, AT&T's ultimate goal is to become an end-to-end information products and services company that will "provide an alternative to IBM where appropriate and coexist with IBM where necessary."

AT&T strengths that will aid that bid include, among other things, an enormous financial presence, large personnel resources and demonstrated manufacturing prowess, Cohen said. He also praised AT&T's "apparent newfound corporate flexibility in its willingness to fill gaps in its product line from external sources."

Weaknesses that AT&T must overcome,

See AT&T page 116

CDLA

Targeting industries for government support has caused Japan "terrible trouble," a Commerce Department official tells the Computer Dealers and Lessors Association/**106**

IPL SYSTEMS INC.

IPL Systems, Inc. last week reported a net loss of $4.2 million for 1983, with revenues down $5.1 million/**108**

INSIDE

■ U.S. officials arrive in Japan to try and head off a crisis over a proposed software law that could require U.S. software houses to reveal their program codes/**108**

■ Tandon Corp. consolidates two California divisions and cuts another 1,000 jobs in favor of offshore production/**110**

Developers of reusable code get a second chance

By Paul Gillin
CW Staff

WELLESLEY, Mass. — The world will take little note of the passing of Readycode from the software market.

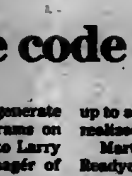
Introduced in 1981 by Raytheon Computer Services, the product incorporated an advanced technology called reusable code, but it enjoyed only limited success. After nearly three years on the market, Readycode had only about 20 users.

But Readycode is not gone from the scene. Enhanced and renamed Programaster, the product is now being marketed by a small company here that spun off from Raytheon Computer Services early this year.

Master Software, Inc. was formed when a group of Raytheon employees this year acquired venture capital and bought Raytheon Computer Services for $3 million, although Raytheon Co. still maintains a 30% share in the new company.

The firm's Programaster employs reusable technology to generate large-scale application programs on IBM mainframes, according to Larry Martin, former general manager of Raytheon Computer Services and president of Master Software.

Freed from the administrative burden of a massive parent company, Master Software hopes to be more successful at establishing an identity for reusable software. Programaster uses a Readycode base but employs such enhancements as full screen editing and improved data base access, as well as access to IBM Vsam files and an upgrade from Cobol 68 to Cobol 74.



Martin

The viability of reusable software is based on the generally accepted view that 80% of all business software code has been written before. If commonly used modules are made reusable and tied together through structured designs and logic structures, productivity improvements of up to several hundred percent can be realized, advocates argue.

Martin said the limited success of Readycode was not due to weaknesses in the product so much as to the difficulties of promoting a new and poorly understood technology within a large company. "Raytheon was a $6 billion company with a $3 million piece selling Readycode," he said in a recent interview. "In a company that size, the approval cycles are so long that it is very difficult to get things done."

Despite its apparent productivity benefits, reusable software has been only mildly successful. A major reason is that the concept is still poorly understood by most technicians, Martin added. "We didn't position Readycode well," he said. "We went first into the marketplace for productivity tools and then later switched and moved into code generation. The problem with having a product that is like little else in the market is that you have to fit yourself into somebody else's definition."

However, the concept is beginning to gain respect, according to Martin. "Two years ago it was almost impossible to get anybody to talk about [the concept]," he stated. "But recently, we've seen our sales cycles drop dramatically." Users now appear more willing to invest in the technology, he said.

Master Software still faces a formidable task. Its primary competition comes from established vendors of fourth-generation languages and application generators. However, Martin believes the line between those tools and reusable software will become clearer as the technology becomes better understood.

Master Software intends to promote the concept of a "reusable architecture" with an on-line version of Programaster, a screen generator and a tool oriented toward managing development.

U.S. officials decry Japanese copyright plan

By Robert Hott
CW West Coast Bureau

TOKYO — Top U.S. government officials are currently locked in urgent negotiations with Japanese authorities here in an attempt to forestall a crisis over software copyright protection.

The U.S. team arrived here recently as the deadline over a controversial proposal from Japan's Ministry of Trade and Industry (Miti) drew near. The Miti plan calls for replacing current Japanese copyright laws with a 15-year protection. It would require U.S. software houses to license and disclose their program code before a software product could be sold in Japan when the ministry deems such software to be "important to public welfare."

The proposal has led to an outcry from American electronic and computer trade associations, with U.S. officials threatening to retaliate by removing copyright protection from Japanese software sales in the U.S. Currently such software is protected for 75 years.

Top U.S. trade negotiator Clyde Prestowitz, assistant to Commerce Secretary Malcolm Baldrige, has also warned that action might be taken against sellers of Japanese software in the U.S., under domestic trade laws, if the Miti proposal is implemented.

Industry and government officials had hoped the controversy would be resolved at a recent meeting of the U.S.-Japan Work Group on High Technology issues here, but instead Japanese officials imposed a March 27 deadline for submission of a draft proposal to the Japanese legislature.

"While we had been optimistic that the proposal from Miti would sink quietly beneath the waves, it appears the issue is still unresolved, and we are continuing to push for U.S. software interests," commented Charlotte LeGates, information officer for the Computer and Business Equipment Manufacturers Association, which has been lobbying the Reagan administration to fight the proposal.

The March 27 deadline sent U.S. officials, headed by Prestowitz, scurrying back to the Japanese capital for a new round of negotiations.

"We have continually expressed our opposition to the Miti proposal. The essential issue here is one of international law," commented Maureen Smith, director of the Office of Japan at the Commerce Department in Washington, D.C.

Smith said Miti is attempting to gain jurisdiction over the software industry in Japan with a law that would place software products outside conventional copyright protection.

"The law they are proposing is not a copyright law. Once software is covered by some other law, the Japanese will no longer be subject to international copyright agreements, and there is nothing to stop them [from] amending the arrangements to suit their needs," she contended.

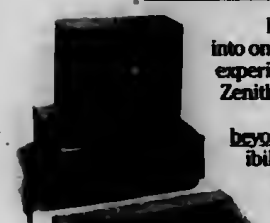
The Miti proposal has also reportedly sparked a fierce fight for political power inside Japanese government circles. Currently, software copyright is administered by the Ministry of Education, which has issued a counterproposal to the Miti plan via its Copyright Council.

The Ministry of Education plan, which would offer copyright protection for software for a period of 50 years, is being backed heavily by U.S. trade associations and the Commerce Department.



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Tymshare deal to tie info group

ST. LOUIS — McDonnell Douglas Corp., which is in the process of acquiring Tymshare, Inc., announced recently it will combine Tymshare with three of its other subsidiaries into a $1 billion Information Systems Group.

Tymshare, operator of Tymnet, is in the process of being acquired through a stock tender offer that expires at the end of the month. McDonnell said it would combine Tymshare with McDonnell Douglas Automation Co. (McAuto) of St. Louis; Microdata Corp. of Irvine, Calif.; and Vitek Systems, Inc. of St. Louis.

McDonnell's president, John F. McDonnell, will assume the additional position of chairman of the new group, which will combine a total of about 12,000 employees and is expected to have sales in 1984 of $1 billion, a spokesman said. Other members of the executive board for the new group will be Robert A. Fischer, president of McAuto, and Gary E. Liebl, president of Microdata.

The first vertical industry business to be established in the group will be McDonnell Douglas Health Systems, Inc., comprised of the Health Services Division of McAuto and all of Vitek, which makes automated laboratory testing equipment.

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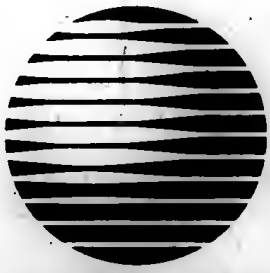
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U.S. officials optimistic about trade with NTT

By John Hindmar
CW Washington Bureau

WASHINGTON, D.C. — High-level U.S. trade officials and several American businessmen said recently they are confident U.S. firms will increase sales to Japan's Nippon Telegraph and Telephone Public Corp. (NTT).

The two countries earlier this year renewed a three-year agreement aimed at facilitating American sales to NTT. The new pact contains a number of proposals the U.S. requested to make the agreement more effective. Sales in 1983 were an estimated $142 million, a threefold increase over 1982. NTT's annual high-technology procurements exceed $3 billion.

U.S. Ambassador William E. Brock, the U.S. trade representative, told the House Subcommittee on Telecommunications, Consumer Protection and Finance that the negotiations leading to the pact's renewal were "an unqualified success" for the U.S. He added that the agreement will lead to greater sales if there are "well-planned and aggressive sales activities by U.S. firms and good faith efforts on the part of NTT."

Commerce undersecretary Lionel Olmer, who heads the department's International Trade Administration, which is responsible for implementing the agreement, said he believes NTT is interested in getting the best equipment at the best price, no matter who provides it, and does not see its main responsibility as furthering government high-technology protectionist policies.

"NTT should not be painted with the brush of Japanese industrial policies," according to Olmer, who said he is "strongly optimistic" about sales to NTT. "We are today on a better footing with NTT than ever before, and our companies support this view without exception," he told the subcommittee.

Providing a businessman's view of NTT, Charles P. Lecht, chairman of Lecht Sciences, Inc., a New York software developer, said he just completed successful negotiations with NTT to sell them Lecht Sciences' educational software products.

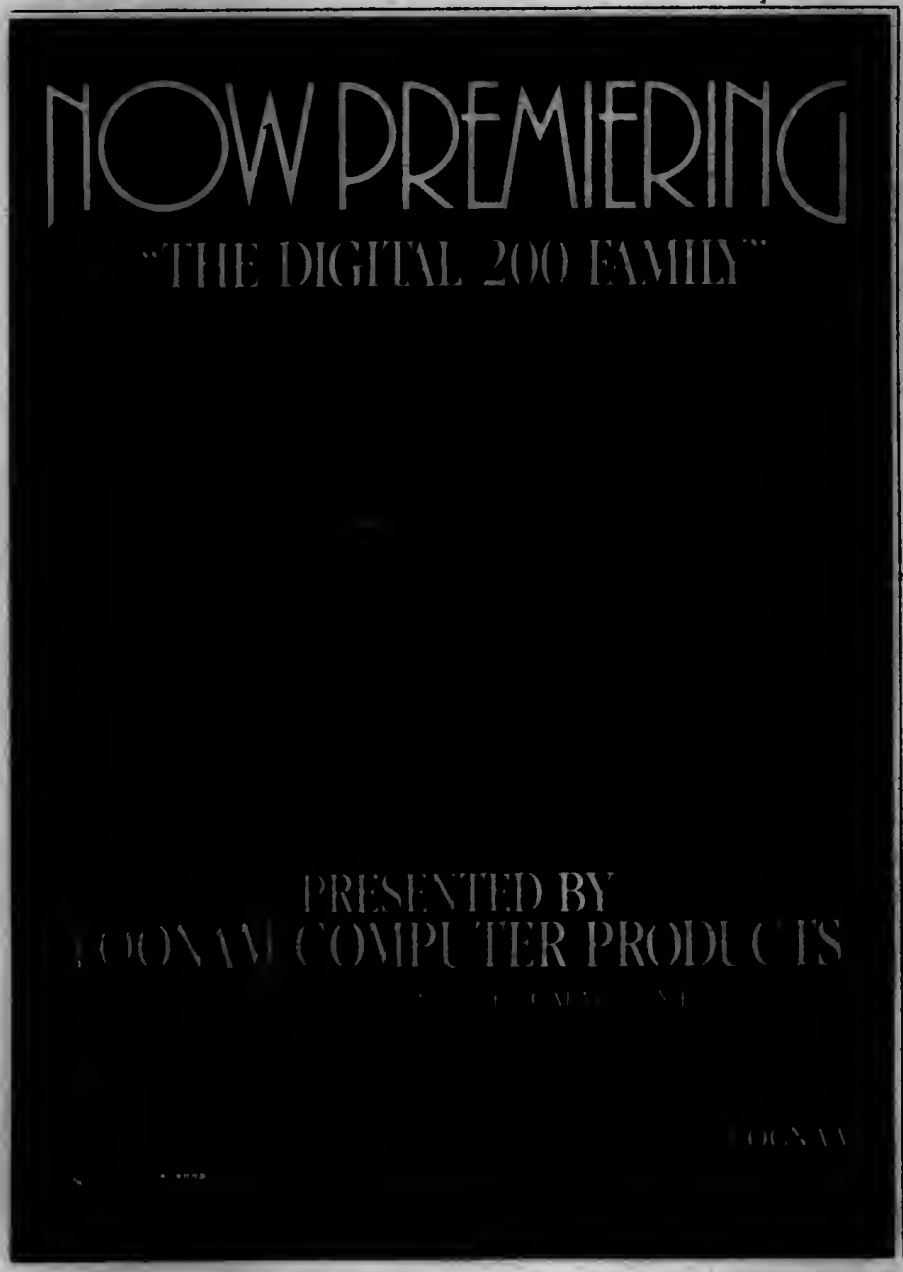
"I found NTT to be a tough but fair negotiator who knew exactly what it wanted and what it wanted to pay. . . . In the end, we both made some compromises and concluded a fair contract," Lecht told the subcommittee.

Lecht said, "Japan is not a closed market, and NTT is not impossible to deal with. What barriers exist are no greater than similar barriers in other nations. In my experience, contract negotiations even with our own government can be complex and drawn out."

He added that his company benefited from his previous business experience in Japan and expert outside counsel during the contract talks with NTT. Lecht complained that there seems to be little U.S. government assistance for small companies seeking business opportunities in that country.

In reply to a question from subcommittee chairman Tim Wirth, (D-Colo.), Lecht said he is concerned about the growing criticism in the U.S. of Japan. "The impact of very negative propaganda regarding the Japanese government and its business practices . . . may serve to undermine the enthusiasm of U.S. firms" that might want to sell to Japan, he suggested.

He also noted that the criticism of Japan may "embarrass" the Japanese and seriously poison cultural and business relations between the two countries.



Bell Labs chip supports Unix

SAN FRANCISCO — AT&T's Bell Laboratories recently announced a second-generation, 32-bit microprocessor said to take advantage of the Unix operating system and planned to be used in a series of AT&T 3B computers.

The chip, called the WE 32100, is the successor to the WE 32000, which was formerly known as the Bellmac-32A. It reportedly contains 150,000 transistors, about 30,000 more than the earlier chip, and uses Cmos technology.

"We have integrated many support functions onto the chip," said Hing C. So, head of the Very Large-Scale Integration Department at Bell Labs. "We have also added features such as an internal cache memory and have increased the speed of the chip."

The cache memory reportedly can hold 64 32-bit words, and repeatedly used program instructions can be stored there so there is no waiting time, a spokesman said.

The WE 32100 reportedly operates at speeds up to 14 MHz, is packaged in a 132-pin package and dissipates approximately 1.9W in worst-case conditions.

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COMPUTER INDUSTRY

Commerce official cites flaws in Japan's targeting

By John Hirshaner
CW Washington Bureau

ACAPULCO, Mexico — Japanese government efforts to target certain industries for support and promotion have caused that country "terrible trouble," according to a U.S. Commerce Department official, who said recently that the U.S. computer industry should not be overly worried about Japanese competition.

Dr. D. Bruce Merrifield, assistant secretary of Commerce for Productivity, Technology and Innovation, said "the idea is great; the concept is beautiful, but there are two basic flaws" with such targeting.

Merrifield, who addressed the Computer Dealers and Lessors Association (CDLA) conference here recently, said the first mistaken assumption about industry targeting is that "the world is stupid and won't try to emulate you." Using the Japanese steel industry as an example, he noted that initial successes in capturing large parts of that market worldwide were followed by similar efforts by other countries, such as Korea.

Now, the world steel industry is overbuilt and operating at only half capacity, according to Merrifield. He said the situation is "a good, living, breathing example" of how "no bureaucrat knows how to target anything."

The other basic flaw of targeting, he continued, is the assumption that once a country has taken over a market, the market will last long enough to pay back the huge initial investment needed to achieve market supremacy. The danger, he said, is that targeting will "destroy an industry for everyone," leaving the targeters saddled with "an enormous debt load" that cannot be covered by future sales.

Turning to Japanese targeting of computer-related industries, Merrifield told the CDLA audience that the Japanese will be successful in continuing to build their high technology industries. But, he added, the world market is so big that it will benefit both Japan and the U.S. He called for "collaborative efforts" between the two nations, predicting "a very powerful, complementary relationship ultimately."

Discussing other U.S. competitors, Merrifield suggested mainland China will "be at the leading edge of everything at the end of the century." The Chinese "are determined and capable people," Merrifield said, noting how rapidly they are trying to assimilate Western technology and management practices.

Asked about China as a competitive threat to the U.S., Merrifield said, "I really am not worried. . . . It's not us against them." According to Merrifield there will be such a large market for high-tech products, particularly among the currently developing nations, that there will be great opportunity for all high-tech producers.

Assessing current U.S. competitiveness, Merrifield said, "We can reclaim and maintain our leadership in every area if we just get our act together." He said the U.S. "has incredible advantages over everybody."

Chief among those advantages, Merrifield said, are the most advanced technology in the world, the most readily available development capital and "a remarkable entrepreneurial culture."

However, he said, the U.S. needs to remove barriers to the increased competitiveness of American industries. Although "the last thing we need is to get the government in there funding or managing anything," he said the government can be a catalyst for industry development, by providing incentives for and removing regulatory impediments to industrial developments.

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Zilog, NEC resolve differences in chip dispute

CAMPBELL, Calif. — Zilog, Inc. and Nippon Electric Co., Ltd. (NEC), involved last year in a bitter dispute involving Zilog's Z80 microprocessor and certain NEC patent claims, have resolved their differences and agreed to licensing arrangements.

Zilog, a subsidiary of Exxon Corp., announced recently it has granted NEC the first license to manufacture and market its Z80,000 32-bit microprocessor.

The alternate source agreement provides NEC with nonexclusive rights to manufacture and market the Zilog product worldwide.

Last year (CW, Aug. 8), Zilog had asked the U.S. International Trade Commission (ITC) to investigate alleged unfair competition by NEC and two U.S. subsidiaries, NEC Electronics U.S.A., Inc. and NEC Home Electronics (U.S.A.), Inc.

Earlier suit

Zilog had earlier in the year filed suit in federal court seeking $40 million in damages based upon charges that NEC and its subsidiaries had copied the Z80 circuits and imported them into the U.S. in the NEC UPD780 and UPD780-1 microprocessors.

NEC Electronics subsequently countersued for $40 million, charging that 14 Zilog parts infringed on NEC's U.S. patents.

Under terms of an agreement announced earlier this year, the companies filed a joint motion with the ITC proposing the pending investigation be terminated, and an administrative law judge issued an initial determination to do so, which has now become final, the companies said.

At that time, the companies said Zilog would receive a license to manufacture certain NEC products, and NEC would receive licenses to manufacture the Z80 and certain other Zilog products.

Other terms of the settlement would remain confidential, the companies said.

Announcing the Z80,000 agreement earlier this month, Franc R. J. deWeeger, president of Zilog, said, "NEC is one of the few companies with a process technology sufficiently advanced to make a product as complex as the Z80,000 CPU."

The 32-bit microprocessor, announced midway through 1983, will be available in "first samples" during the first quarter of 1985, Zilog said. Additional sources for the chip will be named in the future, deWeeger said.

How Dan Feeney Made The Micro To Mainframe Connection



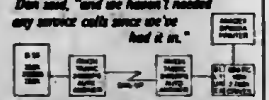
Dan Feeney, systems manager at Alumax Mill Products in Morris, Ill., decided that line charges on one of his IBM model 12 terminals were too high. His firm's corporate headquarters in Chicago was using it to print sales and price reports from the plant's S/34 in Morris and to do online financial modeling.

A PC, Dan reasoned, could do the modeling with any one of the spreadsheet programs available and the reports could be "bicycled" the 50 miles to Chicago. Dan had the terminal removed and bought a PC. The executives were initially pleased with the new system.

"After a period of time the Chicago management missed the communications with the plant," Dan said, "Each week there's a deadline and they must have the reports the same afternoon we produce them. Couriers just couldn't get the reports there in time."

Dan began to question his prior decision to get rid of the headquarters terminal. He looked around for a way to restore communications without having to put the terminal back in. After looking at what was available, he decided to try the BLUE LYNX package.

"It worked the first time we tried it," Dan said, "and we haven't needed any service calls since we've had it on."



Phone line costs are minimal for the BLUE LYNX equipped PC when compared to the charges on the model 12 that was previously in the headquarters office. Also, the total cost of the PC with BLUE LYNX was much cheaper than that of the terminal and printer. Seven hours a day the PC is now off-line running the spreadsheets. The on-line report printing takes only a short time with a 2400 baud rate running over switched lines.

IBM 3251/12 emulation for S/34, S/36 and S/38 users. IBM 3276 emulation - SNA/SDLC or Bisynch $690 complete. Combination of 2 emulators $1230. VT100/52 - DEC VT100/52 emulation software package (requires IBM Adapter) $125

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IDC chairman sees boon for remarketers

'Massive opportunity' for lessors, dealers

By John Kirshner
CW Washington Bureau

ACAPULCO, Mexico — Economic and technological trends indicate steadily growing business opportunities for third-party computer dealers and lessors, International Data Corp. (IDC) Chairman Patrick J. McGovern said recently. Delivering the keynote address to the recent Computer Dealers and Lessors Association (CDLA) meeting here, McGovern said an increasing demand for computer applications and a shortening life cycle for computer equipment are creating "a massive opportunity" for lessors and dealers.



McGovern

Citing IDC statistics, McGovern said there will be a 33% annual growth rate in systems sales through 1987, in the short term, he said, the computer equipment installed base will rise from last year's $123 billion to $264 billion in 1987.

In that four-year period, he predicted, mainframe sales will increase 6% per year, minicomputers 20%, small business computers 49% and peripherals approximately 19%. New, lucrative markets are arising in banking systems, particularly for automated teller machines — which numbered 36,000, worth $1 billion at the end of 1982, and will number 161,000, or $3.7 billion, at the end of 1987 — and in factory automation, which is growing at a 27% annual rate, he said. In addition, McGovern noted the independent software market is growing rapidly, climbing from $1.2 billion in 1980 to $4.5 billion in 1985 and $12.8 billion in 1990. With the cost of software rising relative to the cost of hardware, more and more users will want to spread the costs over the life of the system, which, according to McGovern, means greater opportunities for computer lessors.

Among other changes IDC expects will be an increased importance of software developers and small systems houses, which, he said, will be repackaging and selling 50% of the value of small business computers delivered in 1990.

In general, McGovern concluded, "the environment we sell to today is going to look dramatically different over the next decade." As spending for computers and related equipment becomes an increasingly greater portion of the U.S. gross national product, corporations will be taking a harder look at acquisition strategies and related government tax policies, he said.

"The end user is much more sophisticated" about the financial aspects of procuring hardware and software, he said. The result will be greater business opportunities for dealers and lessors, McGovern maintained.

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COMPUTER INDUSTRY

IPL Systems suffers $4.2 million net loss for 1983

WALTHAM, Mass. — IPL Systems, Inc. recently reported a net loss of $4.2 million for the year ended Dec. 31, as revenues dropped $5.1 million from the level reported a year earlier.

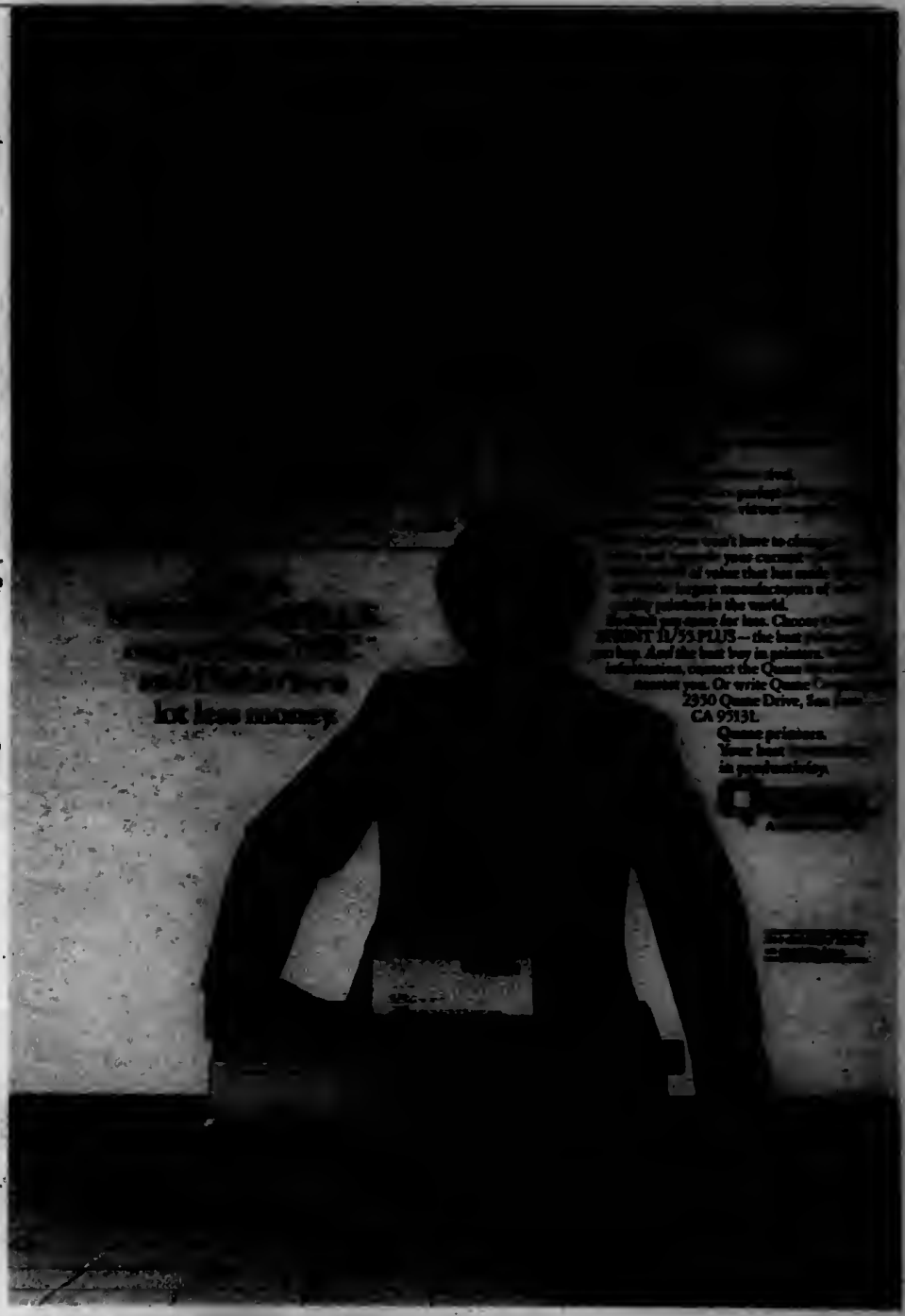
The company reported 1983 revenues of $9.9 million, compared to $15 million the previous year, and a $4.2 million loss, compared to a profit of $277,000 the previous year. Per-share losses were 35 cents, compared to earnings of five cents per share for 1982.

For the fourth quarter, the company posted revenues of $2.2 million, down from $2.5 million in the corresponding period a year earlier, and a net loss of $3 million, compared to a loss of $1.1 million in the corresponding quarter one year ago.

Net earnings for both the year and the quarter, the company said, reflect an income tax benefit resulting from a net operating loss carried back and the utilization of previously unused losses to offset previously provided deferred tax credits. Without those provisions, the company's losses would have totaled $3 million for the fourth quarter and $7 million for the year.

Revenues suffered from delays in shipping the company's Model 4480 Continuous Compatible Computer, intended to compete with the IBM 4361 and IBM 4381 computers, a spokesman said. The company also said it believed sales were adversely affected by several factors, including the "lingering effect of the past economic downturn," potential customers holding off their purchase deci-

See IPL page 111



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SUPERSHORTS

Bell Atlantic will market and service **Proteon, Inc.'s** local-area network, Pronet, through its new subsidiary, **Bell Atlanticom.** Bell Atlantic, comprising seven former Bell operating companies in the mid-Atlantic region, serves 14 million customers.

■

Iomega Corp. has opened a new 24,000-sq.-ft. manufacturing facility, bringing the company's total facilities to 92,000 sq. ft. The expansion will enable Iomega to boost both head and drive production to over 300 units each per day.

■

Xerox Corp. has signed a five-year lease for more than 23,000 sq. ft. of product showroom and demonstration space at Infomart, the Dallas Mart Center's International Information Processing Market Center, scheduled to open in Nov. 1984.

■

VLSI Technology, Inc. (VTI) and **Visic, Inc.** are participating in a joint venture to enhance VTI's design software and to develop process technologies using VTI's wafer fabrication facility. Visic will concentrate primarily on the product design and market development of high performance random-access memory circuits.

■

Harris Corp. has presented **Purdue University** with a Harris 800 superminicomputer. The gift augments the campus engineering computing network.

■

Prime Computer, Inc. and **Frey Associates, Inc.** have reached an agreement to hold the Themis trademark jointly. Lawsuits initiated by Prime in Nov. 1983 over the trademark have been dropped. Under the agreement, Frey Associates, which markets a natural language query software package, will refer to its Themis product as a Management Information System, while Prime will call their Themis product a Logic Simulator.

■

Dataquest, Inc. has expanded its coverage of the Japanese semiconductor industry to include the rapidly expanding Asian markets. Dataquest's Japanese Semiconductor Industry Service now covers Korea, Hong Kong, Taiwan, Singapore and Southeast Asia in addition to Japan.

■

The **National Education Association** Educational Computer Service has assessed, certified and recommended **Control Data Corp.'s** Plato educational courses to its 1.7 million members.

Tandon consolidates divisions, eliminates jobs

CHATSWORTH, Calif. — Tandon Corp. announced recently it is consolidating two of its five Southern California divisions and eliminating 1,000 jobs in a move toward greater reliance on off-shore production of its disk drives.

"Because of increasing price competition from our competitors manufacturing off-shore, we are being forced to rely on our production capabilities in Singapore and India more than we originally intended," company President Sirjang Lal Tandon said.

Tandon said the company will attempt to maintain as much production as possible at its California facilities, but that lower cost production is "unavoidable if we are to meet the price demands of the marketplace."

Another reported factor influencing the move to greater dependence on foreign production was that an increasing number of Tandon's customers "are involved in off-shore production and require direct delivery to their plants in the Far East and Europe."

The consolidation will reduce Tandon's U.S. work force from 2,575 to about 1,575. Tandon last month had eliminated 400 jobs in a move it said was primarily to eliminate duplicated jobs among domestic operations.



COMPUTER INDUSTRY

MERGERS AND ACQUISITIONS

Syntech International, Inc., Dallas, has reached an agreement in principle to acquire Octagon Computer Systems, Inc. of San Jose, Calif., for common stock, which has a current market value of approximately $1.8 million, in addition to certain earn-out provisions.

■

Banctec, Inc., Dallas, has announced a definitive agreement to acquire Scan Data Corp. and the Reader/Sorter Division of Control Data Corp. Banctec will issue 311,000 shares of its common stock for all outstanding Scan Data common stock and 300,000 shares of Banctec common stock for all the outstanding preferred stock of Scan Data.

First Software Corp., based in North Andover, Mass., has discontinued merger negotiations with PC Telesmart, Inc. According to Ken Carpenter, chairman of First Software, further investigations indicated a merger would not have been in the best interest of First Software.

■

Cognitronics Corp., Stamford, Conn., and American Computer Corp., San Diego, have announced that they have merged. Also announced was the acquisition of the net assets and business of American Computer software affiliate Administrative Systems, Inc. by Cognitronics. The initial purchase price is $1.2 million, payable in cash and stock with a potential maximum purchase price of $10 million, depending on substantial future growth in revenues and earnings over a three-year period.

Perkin-Elmer Corp., Norwalk, Conn., has announced that it intends to acquire the Qualitron Corp., Danbury, Conn. Qualitron manufactures masks for producing semiconductor devices, as well as multilevel printed-circuit boards.

■

Computervision Corp., Bedford, Mass., has announced the acquisition of the Organization for Industrial Research, Waltham, Mass., a supplier of group technology and process planning software for computer-aided design and manufacturing.

■

Hewlett-Packard Co. and Xonics, Inc. have signed a letter of intent for HP's acquisition of the assets of Xonic's Ekoline Division for an undisclosed amount of cash. Ekoline, based in Sunnyvale, Calif., manufactures medical equipment that produces images of body structures through the use of high-frequency sound waves.

■

Data I/O Corp. of Redmond, Wash., recently announced it has entered into an agreement in principle to acquire Callan Data Systems, Inc. of Westlake Village, Calif., in exchange for 1.7 million to two million shares of Data I/O common stock. Callan Data manufactures the Unistar workstation using Unix and the Motorola, Inc. 68000.

IPL from page 109

sions in anticipation of an IBM announcement of a new line of mid-range computers and a general slowing of shipments as the current generation of mid-range computers "enter the later stages of their life cycle."

IPL said initial shipments of its Model 4480 are expected to take place in the first half of 1984.



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NICKELS AND DIMES

Visual Technology, Inc. has reported earnings for fiscal 1983 of $47.3 million, or 87 cents per share, up from $25.8 million, or 78 cents per share, over fiscal 1982.

■

Teradyne, Inc. has announced sales of $251.4 million and net income of $21.3 million, or 39 cents per share, for the year ended Dec. 1983.

■

Compucorp has reported a loss of $1.08 per share on sales of 38.2 million for the year ended Dec. 1983. This compares with earnings of 49 cents per share on sales of $35.2 million for the year ended Dec. 1982.

■

Floating Point Systems, Inc. has reported sales of $25.6 million for the quarter ended Jan. 31, 1984, an increase of 19% over the same period last year. Net earnings increased 48% to $3.2 million or 37 cents per share, compared with $2.2 million, or 25 cents per share, for 1983.

■

Wyly Corp. has announced 1983's fourth-quarter income increased to $1.2 million, or 7 cents per share, from $400,000, or 3 cents per share, over the same period last year.

■

Zenith Radio Corp. has reported earnings for 1983 of $46.3 million or $2.11 per share, compared to $24.3 million or $1.28 per share for 1982.

■

Integrated Software Systems Corp. has announced revenues for the year ended Dec. 1983 of $24.1 million, up 45% from revenues of $16.6 million for 1982. Net income rose 72% to $3 million for the year.

■

Western Union has reported a net loss for 1983 of $59.1 million, or $2.78 per share. These results compare with 1982 income of $85.8 million or $3.50 per share.

■

Dynan Corp. has announced net income of $2 million or 12 cents per share, including a net gain of $1.4 million or 8 cents per share for the first quarter ended Feb. 1984. Net sales for the quarter were $52.1 million, compared with $33.1 million for the first quarter 1983.

■

Nixdorf Computer AG, Paderborn, W. Germany, announced it will offer 20% of its share capital in the form of preferred stock in the late spring. The price of shares will be set on the placement date.

■

Datapoint Corp. has announced revenues for the second fiscal quarter ended Jan 31 of $140.8 million, compared with $134.2 a year ago. Net earnings increased to $9.2 million or 45 cents per share, from $1.8 million or 9 cents per share, for 1982.

■

Reim Corp. has announced a tender offer for 3 million shares at a price of $41 per share. The proration period and right to withdraw tendered shares would be on March 6, and the offer would expire March 13.

■

Computer & Communications Technology Corp. has announced that revenues for fiscal 1983 were $83.5 million compared to $74.7 million for 1982. Fourth-quarter revenues were $20.9 million, compared to $16 million for the same period in 1982. A net loss of $24.6 million, or $3.21 per share, was incurred for the year, while a loss of $27.3 million, or $3.56 per share, was reported for the fourth quarter.

■

CGA Computer Associates, Inc. reported that revenues for the nine months ended Jan. 29, 1984 rose 36% to $32.6 million, while three month revenues rose 35% to $11.7 million. Net income for three months rose to $1.04 million or 29 cents per share, a 20% increase. For nine months net income rose $2.5 million, or 71 cents per share, from $2.08 million or 59 cents per share.

■

Comnet has announced that for the year ended Dec. 1983, revenues increased $440.4 million, a 7.5% increase over fiscal 1982.

■

AGS Computers, Inc. has reported revenues of $145.9 million and earnings of $5.7 million, $1.25 per share, for fiscal 1983.

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COMPUTER INDUSTRY

EXECUTIVE CORNER

William T. Clifford has been appointed vice-president, Software Products Division, of Applied Data Research, Inc.

■

Arthur R. Sims, former president of United Information Services, a United Telecommunications, Inc. subsidiary, has joined Computer Sciences Corp. as a corporate vice-president and has been named president of the newly formed Industry Services Group.

■

Robert F. Anderson has been named vice-president of Honeywell, Inc.'s Indirect Sales Operation, in charge of marketing the DPS 6 line of compatible microcomputers, minicomputers and superminicomputers through independent manufacturers' representatives and value-added resellers.

■

Symbolics, Inc. has appointed three new vice-presidents. They are **John T. Holloway**, senior vice-president of technology; **John L. Kulp Jr.**, senior vice-president of research and development; and **Ron Derry**, vice-president of manufacturing operations.

■

Boswell C. Miller has been appointed vice-president, systems marketing, at U.S. Satellite Systems, Inc.

■

Jay Lavoie has been appointed vice-president, systems integration, at Martin Marietta Data Systems, a division of Martin Marietta Corp.

■

R. Patrick Forster, a Litton Industries vice-president, has been appointed president of the company's Itek Graphic and Compositions Systems Division.

■

Gary R. Anderson has been elected president and chief operating officer of Execucom Systems Corp.

■

Roland Boisvert has been appointed vice-president of marketing at Computer Services Corp.

■

Pat Rickard has been appointed vice-president of product development at Paradyne Corp., reporting directly to Kenneth Wall, senior vice-president, operations. Rickard joins Paradyne with over 18 years of product development experience with IBM and was most recently vice-president of development for NBI, Inc.

■

Dominick A. Intartaglia has been elected vice-president, business development, for RCA Global Communications, Inc.



■

Harold L. Brownman, president of Lockheed Electronics and executive vice-president of the Lockheed Corp., has joined the board of directors at Verdix Corp.

■

Jon R. Cornell has been elected senior vice-president, semiconductor sector, at Harris Corp.

■

Graham R. Briggs has been named vice-president of finance at Charles River Data Systems, Inc.

■

James G. Moore has been appointed vice-president of systems programming and **Frederick G. Roberts** has been named vice-president of marketing at Microcomputer Graphics, Inc.

Continued on page 114

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COMPUTER INDUSTRY

Continued from page 113

Gale C. Morgan has been appointed manager of the artificial intelligence marketing group at Digital Equipment Corp.

■

Jack M. Kirber has been named president of GTE Communications Products.

■

Peter F. Pellmann has been promoted to corporate vice-president of office products marketing for Compuscan, Inc.

■

George C. Kenney has been named vice-president of Sony Corp.'s Information Products Division.

■

Charles M. Bacher has been appointed president of Emulex-Caribe, Emulex Corp.'s manufacturing subsidiary in Dorado, Puerto Rico.

■

Stephen M.D. Day has been elected vice-president, corporate development, of Communications Satellite Corp.

■

D.W. McArthur has been named vice-chairman of the Computer and Business Equipment Manufacturers Association.

■

Howard L. Nevin has been appointed vice-president, product planning and corporate development, at Verdix Corp.

■

AT&T Technologies, Inc. has announced the election of four vice-presidents. They are **Marilyn Laurie**, public relations and public affairs; **Paul M. Enlow**, assistant general counsel; **David M. Mitchell**, financial management and control; and **Robert L. Shaughnessy**, human resources and labor relations.

■

Paul E. DeLacey has been promoted to vice-president of manufacturing operations for Honeywell, Inc.'s Office Management Systems Division in Billerica, Mass.

■

Ivan Socher, former president and chief executive officer of Amdax Corp. (now a subsidiary of Ungermann-Bass, Inc.), has joined Fibronics International. He will spearhead the introduction of Fibronics' "coaxial doubler" in North America.

■

William J. McCreary has been appointed vice-president, program development, of Computer Science Corp.'s Systems Group.

■

Jean-Paul Gagnon has been appointed vice-president, commercial sales, Integrated Office Systems, and **Thomas E. Worthy** has been named executive vice-president, marketing, at Northern Telecom, Inc.

■

Robert K. Reid has been appointed vice-president of product marketing at NBI, Inc.

■

Gregory J. Lissandri, chairman and chief executive officer of Wyly Corp., has assumed the responsibilities of chief operating officer in a restructuring of the company's senior management organization. **Paul E. Newton** has been appointed senior vice-president of University Computing Co., a Wyly subsidiary.

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The BiComM-3700 was developed by Wilmot Systems Inc

BANKRUPT from page 99

said they needed, we had to provide."

Wright defended the contracts: "These contracts worked well with some users, and we quickly developed their system. But others were, in my opinion, not reasonable. We spent a great deal of time customizing their system and not making as much money as we hoped because costs were fixed."

Some employees thought the company needed a standard product that it could tailor to each user. Jack Donovan, former marketing director, noted, "Lack of a standard product was critical in the company's demise." Wright said a standard package was under development, based on experiences with earlier users, but the company ran out of funding.

Another problem surfaced because the company hitched its star to Wicat Systems, Inc.'s System 150 microcomputers, but insurance companies were looking for systems that used IBM microcomputers. "A number of companies said they were interested in the product," Donovan said. "But they wanted us to come back when the software ran on the IBM Personal Computer." Last month, the company began testing a pilot version of the product that ran on an IBM microcomputer.

Compounding these problems was the company's explosive growth from three people at incorporation to 75 employees in June 1983. Signs of fiscal problems surfaced last summer when quarterly bonuses were promised, but not given to employees. "The company should have realized sooner that it needed additional capital," Donovan said.

According to Wright, the company tried to do too much. "As we customized each package, upgraded the software, tailored the software to the IBM Personal Computer and developed a standard product, debts grew. In hindsight, maybe we should have tried to grow more slowly and do a little bit less."

As of now, the fate of the company's users and assets is uncertain. While a Chapter 11 filing brings a reorganization, a Chapter 7 filing requires a complete liquidation. "The company needed a financial backer to file a Chapter 11, but it didn't have one," according to one former employee.

Wright hopes to form a support company for current users. "The technology is just too powerful to let slip away," he said.



APRIL 30.

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AT&T seen leading off with superminis

NEW YORK — AT&T's coming out party is just around the corner and will be signaled by the introduction of the company's first commercially available computers, according to Stephen P. Cohen, vice-president and director of The Gartner Group's Industry Service.

The first processors AT&T will market will be the 3B20 and 3B5, superminicomputers that have been available to Bell system companies for some time, Cohen said.

Follow-up products will likely be smaller versions of the 3B5. These will include the 3B2-400 and 3B2-300 minicomputers that will range in price from $50,000 to $75,000 and provide departmental computing power, Cohen said.

He also predicted that AT&T will introduce a multiuser personal computer that will be priced in the $15,000 range.

High-end AT&T personal computer products will likely include the 3B2-200 and 3B2-100, $5,000 to $15,000 systems that support Unix and perhaps Microsoft, Inc.'s MS-DOS as a guest operating system.

To compete in the personal computer market typified by the IBM Personal Computer and Personal Computer XT, Cohen hypothesized, AT&T will rely on products from Convergent Technologies, Inc. and from Olivetti Corp.

Cohen expects all of these products to be introduced between now and the first quarter of 1985. Because equipment will initially come from many sources, he said, the company's early products may lack integration and may even occasionally compete against each other.

WILL THE AT&T BREAKUP MEAN AN MIS SHAKEUP?

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And be sure to keep watching, because more hard-hitting issues of Computerworld Reports such as DP/Office Automation Integration and The Maturing Information Center will be coming in the months ahead. Or, previously released Reports addressing major issues are still available including: The MicroMainframe Link, Integrated Microcomputer Software and Managing the Communication Network.

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AT&T from page 98

he said, include the lingering effects of reorganization, which carries with it the necessity to breed a new corporate culture fired by competition. Perhaps even more importantly, Cohen pointed out, is that AT&T has to cultivate relationships with new sales contacts, particularly among MIS managers.

Other than further development of its Net 1000 service and its continual efforts to sell the System 85 digital private branch exchange, Cohen predicted AT&T's adding emphasis on the marketing of its Unix operating system and the commercial introduction of a family of processors, ranging from superminicomputers to single-user personal computers, would also aid in its bid.

IBM, on the other hand, needs to beef up its communications equipment and service offerings to be a complete information industry supplier.

Richard E. Imerahein, corporate vice-president of research at Gartner, said that IBM won't wait until AT&T brings the battle to it, but will "investigate and/or enter all segments of the communications business except those that are rate-of-return regulated or union dominated." He does see, however, IBM entering rate-of-return regulated markets where strategic.

Imerahein noted that while he anticipates IBM's "confrontation with AT&T in communications will be secondary to the battle in office systems," IBM will expand certain communications pieces already in place.

He speculated that IBM will build on and improve its Systems Network Architecture, beef up the Information Network and even try to acquire another third ownership share of Satellite Business Systems (SBS) by buying out Aetna Life & Casualty Co.

Imerahein believes SBS losses will continue, but noted that IBM forecasts a big demand for private and semiprivate data communications networks in the late 1980s.

FUJITSU from page 99

technical resources — far more of that, including semiconductors, than any other non-IBM company."

If you have any doubts about just who calls the shots at Amdahl, just ask the man who founded the company and had to leave his name behind.

Gene Amdahl, who left Amdahl Corp. and now heads Trilogy Ltd., said in a recent interview that Fujitsu always has managed to protect its interests.

When Fujitsu representatives perceived their company had an interest in an Amdahl Corp. manufacturing area, they always made sure those interests were protected, according to Amdahl.

The acquisition "actually may be more helpful to Amdahl, [which] may be able to use more advanced technology," he said. On the flip side, it may just increase the perception that Amdahl Corp. is under the control of the Japanese, "but not any more than it always has been."

If Fujitsu actually does turn Amdahl Corp.'s marketing, distribution and servicing organization to its own use, it just may have the products and the financial stability to keep a healthy dose of free enterprise in the U.S. computer industry.

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You will be involved in developing compiler code optimizers for "C", Pascal, FORTRAN, etc, to take advantage of the NS16000 elegant architecture. Your background should include two to five years' experience in compiler development; UNIX experience is desirable.

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AND, in the Washington, D.C.-Philadelphia Area we have need for a:

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This position requires prior experience directing on-going software support combined with a strong technical background, preferably with microprocessor-based assembler. Strong customer relations skills and prior experience managing a small group of professionals is also required.

We offer competitive salaries including incentive bonuses, company paid benefits and flexible working hours. If you are qualified and interested contact our representative nearest the city you have an interest:

In Southern & Eastern States contact:
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ISC Systems Corporation
1100 Circle 75 Parkway
Suite 350
Atlanta, GA 30339

In Midwestern States contact:
Kathy Amerman
ISC Systems Corporation
2015 Spring Road
Suite 150
Oakbrook, IL 60521

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Our I/S Development Department is seeking professionals with a minimum of 3 years experience in development and maintenance of ACF/VTAM and ACF/NCP. Qualified applicants must have a thorough understanding of BSC and SNA protocols, systems maintenance using SMP, and IBM/370 assembler language. Background in CICS/VS helpful but not necessary.

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This is a new position created primarily for the support of the academic user community. Candidates should expect that duties and responsibilities may change as the computer and computer systems become operational and the user community becomes proficient in the use of this facility. Candidates must be able to effectively communicate with both non-computer literate and computer literate individuals in a manner which promotes understanding and cooperation. The ideal candidate will have experience in a user support capacity and data management experience. The position requires a minimum degree with course substitution of experience allowed and five years experience in systems programming, systems analysis and/or applications programming. Prefer at least three (3) years with an academic institution and at least two (2) years in a leadership position. Salary range upper $30's to lower $40's. Application deadline April 15, 1984. Send vita and two letters of reference to:

M. D. Bullock, Chairperson,
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Applicants should possess a master's degree and have computing and administrative experience. Salary range is commensurate with position and experience. The deadline for applications is designed to assure higher action by New York Sept. 1, 1984.

Indiana University at Kokomo is one of the six regional campuses of Indiana University and is part of the IU system of campuses. The mission is to meet the educational needs of north central Indiana through a broad spectrum of undergraduate degrees and graduate degrees.

Applicants should send a complete curriculum vitae and the names, addresses, and telephone numbers of three references to:

Dr. Phillip G. Hartley, Chairperson
Director of Computer Services
Search and Screen Committee
Indiana University at Kokomo
2300 S. Washington St.
Kokomo, IN 46902

The search will continue until the position is filled, but applications received by April 1, 1984, are given full consideration.

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Experience: Considerable progressively responsible independent programming experience preparing data processing applications in on-line, real-time operating environment, interfacing effectively with users. Experience in developing or maintaining a system using COBOL and non-procedural language.

Education: Bachelor's degree in computer science, mathematics, or a related field. Experience may be substituted for education.

Deadline: April 2nd, 1984 5PM

Supplies: State Center Community College District, Personnel Commission, 1525 East Weldon, Fresno, CA 93704. Phone (209) 226-6720.

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Desirable experiences include protocol design, implementation and testing, an understanding of operating system principles, use of Ethernet, structured programming languages, and work with technical committees. An undergraduate degree which consisted of 30 semester hours in mathematics, physical sciences and computer science and included differential and integral calculus courses is required in addition to at least three (3) years of experience in the computer science field.

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SYSTEMS PROGRAMMER III

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The UACN provides the Statewide University of Alaska System academic and administrative computing and data communications services. The Systems Programmer III is responsible for the development and management of computer operating systems and programs as well as the supervision of supporting technical and clerical (data entry) personnel. Major duties include determining hardware and related system requirements, developing and implementing operational configurations to satisfy these requirements. As a minimum, the successful candidate must possess a knowledge of systems software development and maintenance and skills in selecting, training and supervising programmers and/or support personnel. Also, abilities to evaluate EPD equipment and software, to determine requirements for new systems, and to supervise the design, implementation, maintenance, and documentation of systems software are required.

The position is based in Fairbanks, Alaska and will report to the Director of Network & Operations. The salary range begins at $41,574 D.O.E.

Application letters, together with a resume and to least three professional references, must be postmarked by June 30, 1984 and sent to:

Statewide Office of Human Resources Development
University of Alaska
202 Tanana Drive, Room 1 Bunnell Building
Fairbanks, Alaska 99701

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Responsibility:
Design & develop new products. Hands-on responsibility for developing specifications and coding.

Requirements:
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DATA BASE PROGRAMMERS & PRODUCT DEVELOPMENT PROGRAMMERS

Responsibility:
Implementation and maintenance of software relating to customer data bases and decision support systems.

Requirements:
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- knowledge of data base structures and controls
- systems analysis experience

In addition to an excellent opportunity for professional growth, we offer a highly competitive salary and comprehensive benefit package. Please send your resume with salary history to: Victor Sarsangal, MEDSTAT Systems, Inc., 3135 S. State Street, Suite 107, Ann Arbor, MI 48104.

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SYSTEMS ANALYST- BUSINESS APPLICATIONS

We are embarking on a long-range project to integrate business applications using state-of-the-art technology. Your experience in the design and implementation of real-time integrated data base systems should include such applications as Manufacturing Resource Planning, Material Management, and Financial Management. You will be working with user departments developing detail system specifications, preparing project summaries, evaluating alternatives, recommending proposed solutions with related cost/benefits. Aerospace background a plus.

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Ms. Beverly DeAngelo, Professional Employment, ITT Avionics Division, 390 Washington Avenue, Nutley, New Jersey 07110.

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STARTING DATE: September 10, 1984.

Send complete resume to:
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Exceptional opportunity for qualified Programmer/Analyst with 5+ years experience in programming, systems design. You will join a results oriented project team responsible for the development of integrated manufacturing and financial systems. Candidate will possess a minimum of 3 years System/36 experience writing interactive applications utilizing RPG II and COBOL in a manufacturing environment. Degree in C.S. or equivalent required.

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Program Resources, Inc. has an immediate need for an IBM Systems Programmer to lead our systems programming efforts at the Rockwell International Research Center near Little Rock, Arkansas. Position requires at least 3 years experience in VM/SP, OS/VS1. Related experience in RSCS and customized CMS applications a plus. This growth has excellent growth potential and real visibility within one of the nation's largest research facilities dedicated to state-of-the-art computer technology.

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705 Giddings Avenue
Suite M4
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Faculty/Staff Relations
SUNY College at Brockport
Brockport, NY 14420

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This position is a joint appointment serving both the College of St. Benedict and St. John's University. Responsibilities include analysis of operating for a DEC PDP 11/70, also the direction, planning and coordination of operations analysis in regard to data processing applications. Bachelor's degree in Computer Science or related field including course work in one or more of the following languages: BASIC, FORTRAN, PASCAL, COBOL, MACRO-11, Assembler Language. Course work in accounting and statistics desirable. Business interfacing and technical writing skills required. Position available July 1, 1984. Send letter of application and resume to: Director of Personnel, St. John's University, Collegeville, MN 56321. Applications received after May 1, 1984 cannot be given equal consideration. Women and minorities are encouraged to apply.

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Rapid expansion of our computer maintenance organization means excellent opportunities for aggressive individuals in the Chicago area with two or more years experience in DEC PDP-10, 11 or VAX.

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Lisle, IL 60532
(312) 964-0248

or Jim Abele,
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6333 Harry Hines Blvd.
Dallas, TX 75235
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Assistant or associate professor of Computer Science, tenure-track, beginning August 1984. Computer Science program already existing. ACM recommended curriculum. BS and AAS degrees. Ph.D. desired, but ABD or experienced MS considered. Competitive salary and benefits; summer teaching possible. University of Arkansas at Little Rock is a 10,000+ student, urban university. Application deadline May 1, 1984. Please send resume, and letters of recommendation and transcripts to:

Maynard P. Sills, Coordinator,
Department of Computer Science,
University of Arkansas at Little Rock,
33rd and University,
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PROGRAMMERS
IBM SYSTEM 38
DIGITAL 11/70 (RSTS/E)

Ventron, a specialty chemicals division of Morton Thiokol, Inc., located just north of Boston, is growing at a rapid pace. To meet the challenges of expanding markets and increasing business, our MIS staff is assuming more responsibility and needs additional support.

Converting to an IBM System 38 during the past 18 months and increased business applications in this area has created an opening for a programmer on the IBM system. Retaining our Digital 11/70 requires competent personnel to maintain this area of programming as well. Two programmer positions are currently open:

IBM SYSTEM 38

as part of the IBM effort, you will be working with a state-of-the-art data base, a virtual machine, and software packages that perform financial and distribution functions. The desired candidate will be strong in RPG II or RPG III with at least 1 years experience in addition to a college degree in Business or Data Processing.

DIGITAL 11/70 (RSTS/E)

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Please send your resume and salary requirements to:
JUNE A. VETTER
Personnel Administrator

MORTON THIOKOL, INC.

Ventron Division
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This successful candidate will teach state-of-the-art data processing courses in a classroom environment utilizing multi-media aids including video and computer based training. Subject matter will encompass: MVS/JCL; Utilities; TSO CLIST; programming concepts; and some user and microcomputer languages.

Applicants must possess a Bachelor's degree in Computer Science, Business or Education, and a minimum of four years experience in developing and teaching Data Processing courses. Excellent oral and written communication skills are essential. Familarity with multi-media presentations is desirable.

This position offers a competitive salary plus an excellent benefits program that includes company paid medical, vision care, dental, pension plan, life insurance and educational assistance.

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P.O. Box 270,
Hartford, CT 06141

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COMPUTER SCIENCE
Smith College

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DATA PROCESSING PROFESSIONALS

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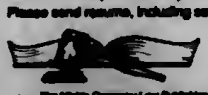
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1040 Gulf Life Tower/Jacksonville, Florida 32207
(904) 399-7371

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National Bureau of Standards
Administration Building, Room A-129
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Attn: Ms. Josephine White (C0720)

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Applications: A letter of application with, curriculum vita, and names of 3 references should be sent by March 30, 1984 to:

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Education and Career Information Bureau
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Analyzes business procedures and problems to refine and convert to programmable form for a fast growing Boulder company. Develops the problems and needs of corporate officials. Designing of software systems, i.e. computer programs to solve problems, including program flow functions necessary to fit the company's use. Would be on call for troubleshooting or implementation or modification of program after that. M.S. in Computer Science required, plus 2 years experience. Must be familiar with Vax-11/780, PDP-11/70 and IBM 3/4/43. Must know "C" and Oracle and have good communication skills. Salary $30,000 - $35,000/yr. 8-5 M-F, 40 hrs/wk. Submit resume to DATA Corporation, 313 S. Vaughn Way #104, Aurora, CO 80014, attn: Chuck Spring.

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SOUTH PACIFIC

The TERRITORIAL GOVERNMENT OF AMERICAN SAMOA announces several vacancies at its Computer Center.

Current hardware consists of two 1MB NCR V8465 computer systems. A large conversion task from batch processing to an on-line, integrated financial management system is about to begin using software packages supplied by Moore Data Systems Inc. The government is recruiting for the following contract positions:

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Responsible for planning, directing and evaluating the various functions of the Information Systems Division; under the administrative direction of the Treasurer and managing a staff of twenty-two, the Deputy Director supervises all technical and operational data processing activities of the American Samoa Government. Basic qualifications include a Bachelor's Degree and eight years of progressive responsibilities in data processing systems, at least three of which should have been on the managerial level; a salary for this position will be commensurate with qualifications and experience.

Computer Programmer/Analysts (4)

Requires a Bachelor's Degree or equivalent in computer science, mathematics or closely allied field plus six years of data processing experience; one of these positions will include managerial responsibilities. Salary range: $19K to $25K.

In addition to these minimum qualifications the successful applicants should have working experience using multi-programming operating software, COBOL 74, on-line concepts and methods as well as programming experience with typical financial applications. Knowledge of NCR's VRX O/S, RPG and system software support are highly desirable.

The American Samoa Government provides free transportation and shipping allowances for contract employees and their dependents. These positions are non-Federal employment for a two year term and include benefits such as twenty-six days annual leave, on-island medical care and furnished housing for a nominal monthly rent. American Samoa is a Territory of the United States and is located in the heart of Polynesia; it enjoys a year-round tropical climate and an informal lifestyle similar to Hawaii.

To apply for one of these vacancies, please state which position you are applying for and airmail a complete resume and copies of your credentials to: The Director, Office of Manpower Resources, AMERICAN SAMOA GOVERNMENT, Pago Pago, American Samoa 96799.

DEADLINE FOR RECEIVING APPLICATIONS IS March 30, 1984. Selected interviews will be conducted in the United States during April with a probable commencement date in late May or June 1984.

All applicants will receive consideration without regard to race, color, religion, sex or national origin. AN EQUAL OPPORTUNITY EMPLOYER.

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Requires degree and 1-3 years experience. Must have COBOL (prefer COBOL 74) Burroughs hardware experience preferred. Applications experience in product movement and/or business systems a plus.

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Positions require degree and approximately seven years total experience with at least two years in systems analysis in design of on-line/real time applications. Must have experience with Burroughs systems. Should have experience in product movement and/or business systems applications

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[illegible] University is seeking an individual with an in-depth understanding and at least one year of full-time employment with responsibility for medium to large scale mainframe operating systems, preferably Burroughs MCP. Responsibilities of the position include maintenance of the operating system and a custom transaction processing system, technical support to remote users, development staff and remote users, and on-line application development. The University currently has a Burroughs B6900 with 5 meg of memory and approximately 100 terminals.

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This position is to be available on May 1st. Salary range is $9K to $20K, depending upon experience. The position includes a generous benefits package, an attractive location, and good working conditions.

Interested persons should submit resumes by April 1st to:

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Computing Center
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East Stroudsburg, Pa. 18301

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Programming

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MDL

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Minimum qualifications include a bachelor's degree or equivalent in computer science or related field and five years of successful professional experience in data processing, including three years in supervisory and management positions.

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Director of Finance
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EOE

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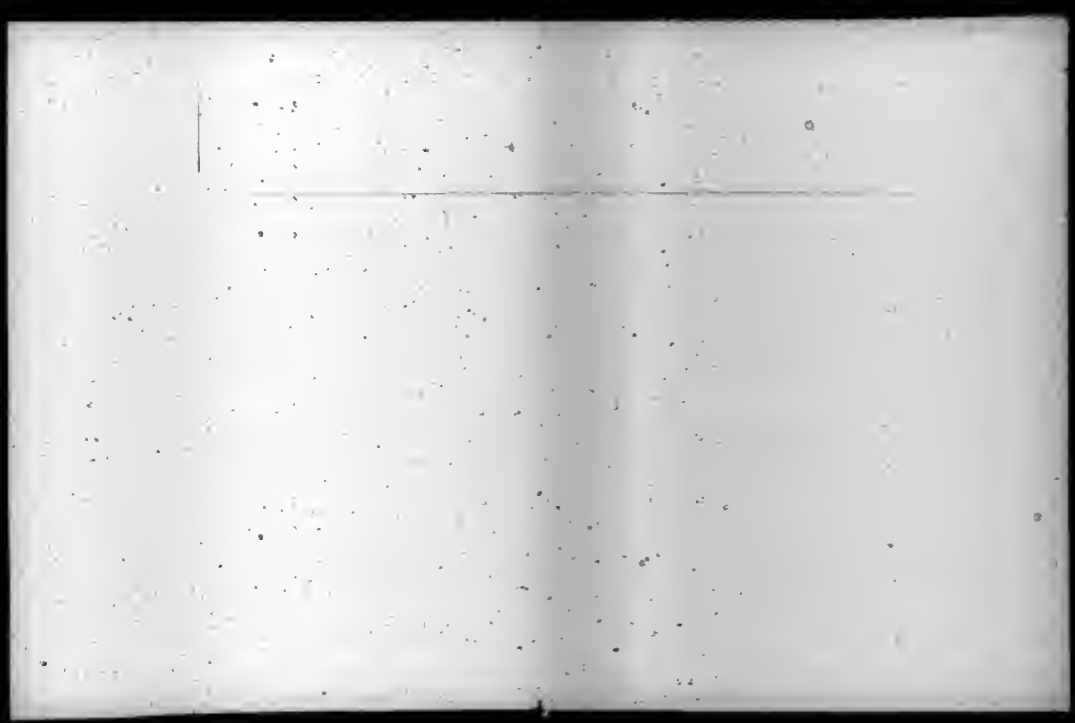
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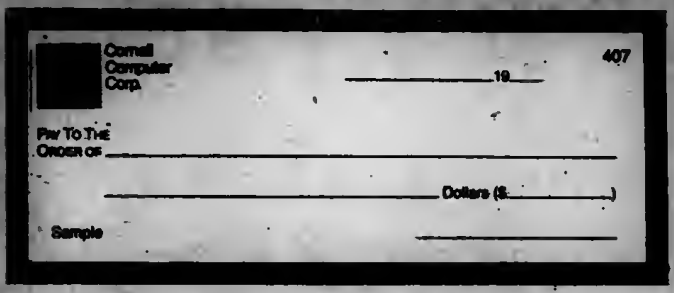
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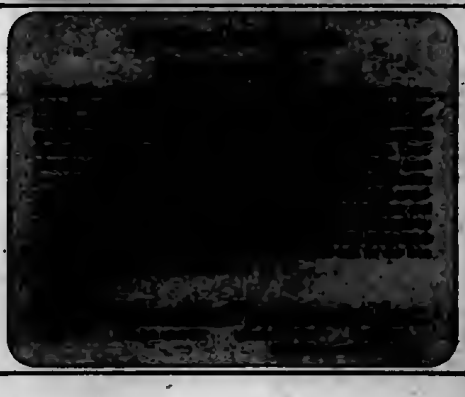
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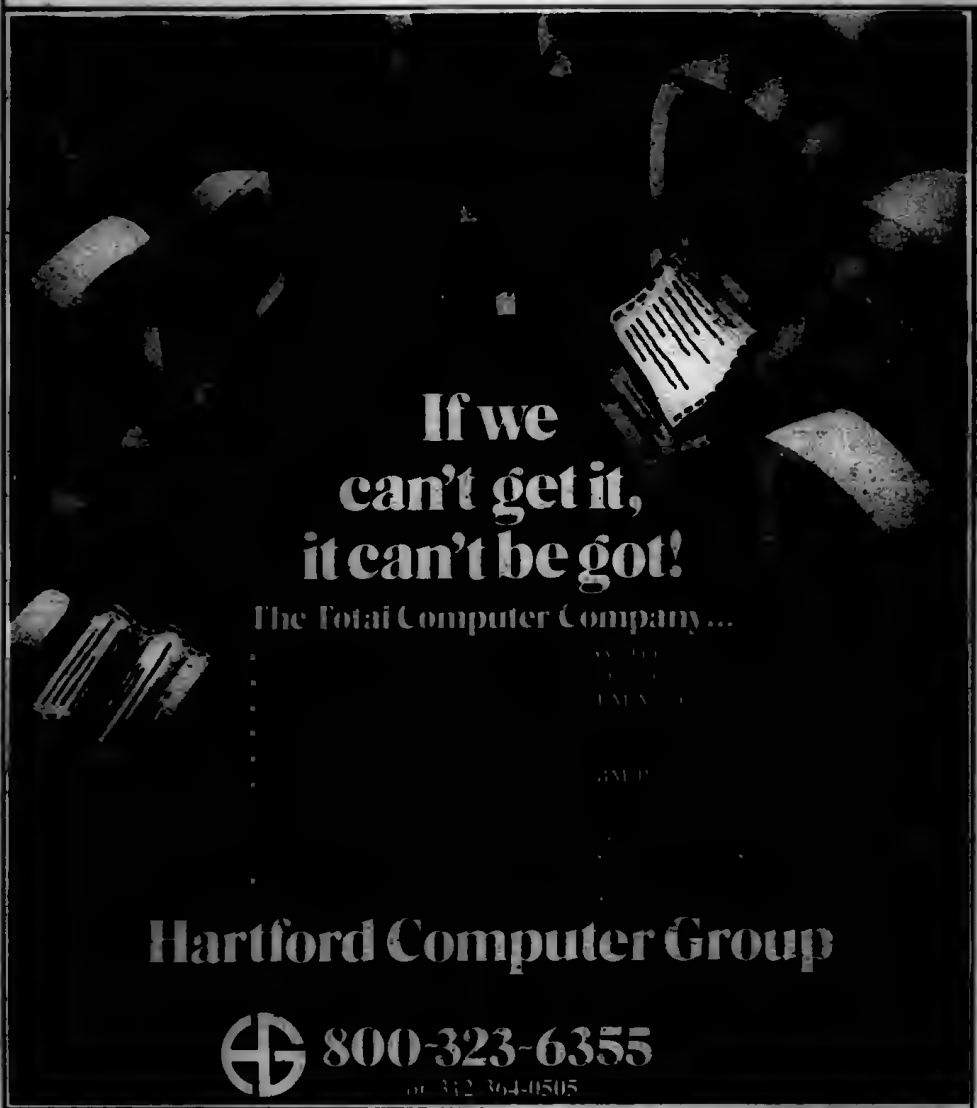
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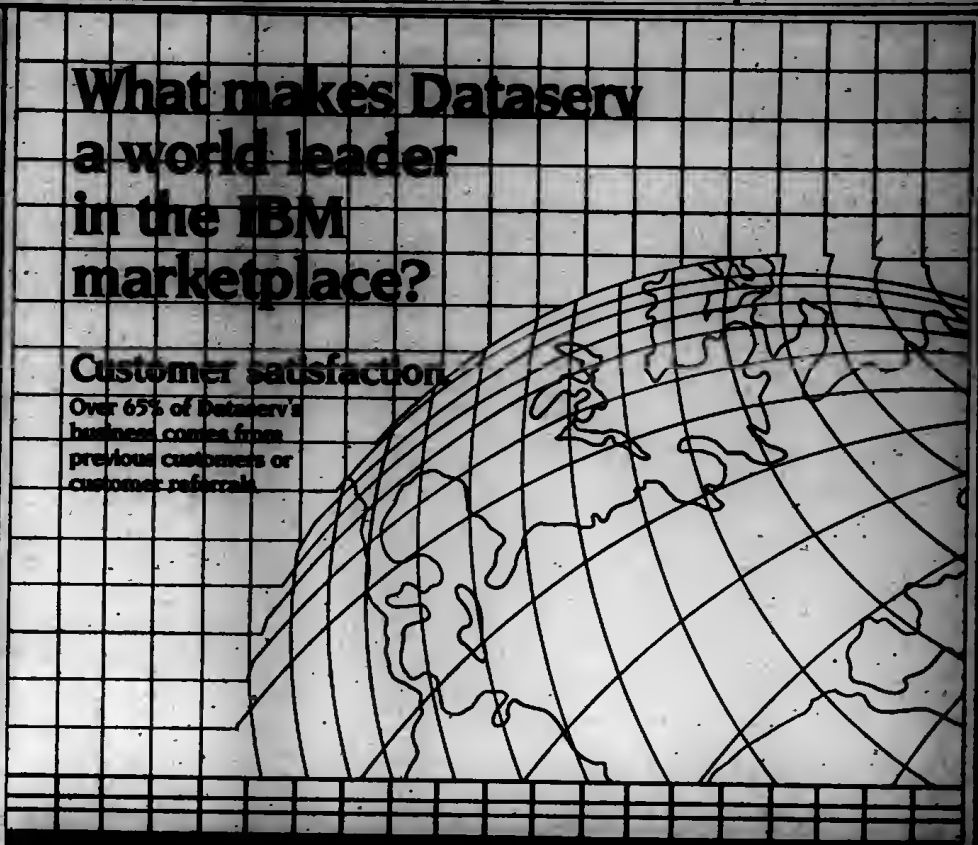
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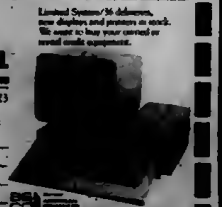
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Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

The price for each standard unit is only $130.00. There is a one unit minimum and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld.

How to Place an Ad in the Bulletin Board.

Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon or call one of our ad-takers. (If your company has never advertised with us before we request a check or purchase order number with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classified section under the heading "The Bulletin Board.". We assume no liability for errors beyond the price of the ad in the case of material errors.

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Copy: Copy sent in via the mail or telecopier (telecopier instructions and 410 and 451) should be clearly typewritten. Ads may be given over the phone to our ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $115.00 (One unit minimum and no fractional units allowed.) There are no agency commissions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Date(s):_____

Signature:_____

Name:_____

Title:_____

Company:_____

Address:_____

Telephone:_____

Send this form to:
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Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Business Opportunities and Real Estate).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Costs: Our rates are $138.10 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $276.20 per insertion. Extra space is available in half-inch increments and costs $64.05. Box numbers are $15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us,) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____

Title: _____

Address: _____

Telephone: _____

Send this form to:

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CLASSIFIED ADVERTISING,
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Saudi Arabia: Mr. Omar Dusuki, General Manager, Saudi Computerworld, P.O. Box 5455, Jeddah. Phone: 6675916/6650380. Telex: (926) 401205.

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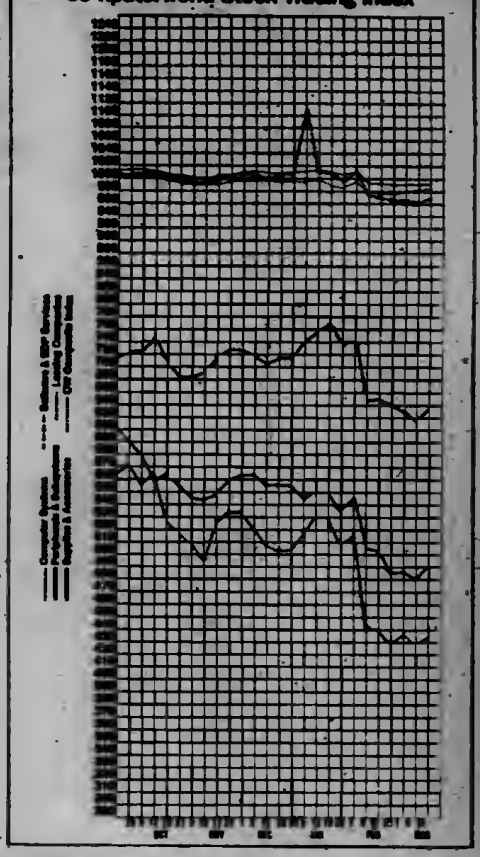
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CLOSING PRICES WEDNESDAY, MARCH 14, 1984

All statistics compiled computed and formatted by TRADE QUOTES INC Cambridge, Mass 02139

	PRICE 1983-84 RANGE (1)	CLOSE MAR 14 1984	CHNG NET MARKET	CHNG PCT CHANGE
COMPUTER SYSTEMS				
ALPHA MICROSYSTEMS	11- 24	20 1/2	+1 1/4	+10.0
ALTOS COMPUTER SYST	9- 20	11 1/2	+1 3/4	+17.9
ANSAN, CORP	6- 30	10 3/4	+ 3/4	+8.1
APPLE COMPUTER INC	19- 63	36 1/2	+ 1/2	+1.4
AT&T	72- 78	75 1/2	+ 1/2	+0.7
BURROUGHS CORP	39- 58	67	+1 7/8	+8.1
COMPUTER AUTOMATION	9- 17	8 1/4	- 1/4	-2.9
COMPUTER CONSOLES	6- 11	10 1/2	+1 3/8	+15.0
CONTROL DATA CORP	21- 33	26	+2 1/2	+7.0
CONVERGENT TECHNOL	10- 41	15 3/4	- 1/4	-1.5
CRAY RESEARCH INC	39- 88	73	+3 1/4	+7.0
DATA GENERAL CORP	28- 47	46 1/2	+1 1/2	+3.3
DATAPOINT CORP	15- 31	29	+ 3/4	+2.7
DIGITAL EQUIPMENT	62-100	91	+3 1/2	+3.8
EDCO 100	9- 19	14 3/4	+ 3/4	+5.3
ELECTRONIC ASSOC.	6- 10	8 1/2	- 1/4	-2.9
FLOATING POINT SYST	19- 43	33 1/8	+1 1/8	+3.5
FONOMAN	23- 37	33 1/4	+1 1/4	+3.9
GENERAL AUTOMATION	6- 20	10 3/4	+ 1/4	+2.4
GRID INC	29- 44	36 3/4	+1 1/8	+3.2
HARRIS CORP	29- 51	35 3/4	+ 1/4	+0.7
HEWLETT-PACKARD CO	72- 99	97	+2 1/4	+2.3
HONEYWELL INC	39- 58	58 1/8	+2 3/8	+4.0
IBM	97-129	112	+3 3/4	+3.1
ISL SYSTEMS INC	2- 10	4 1/8	- 1/8	-2.9
M/A-COM INC	15- 36	34 3/8	+1	+3.0
MANAGEMENT CONT SYSTS	1- 3	2 7/8	0	0.0
MANAGEMENT ASSIST	7- 18	15 1/2	- 1/8	-0.8
MATSUSHITA ELEC(ADR)	47- 69	65	+1	+1.6
MODULAR COMPUTER SYS	3- 10	7 3/8	+ 1/8	+1.8
NATIONAL DATA CORP	19- 39	34 1/2	+ 1/8	+0.4
MOTOROLA INC	33-140	118 7/8	+3 3/4	+3.3
NEC'S SEMICONDUCTOR	13- 37	34 3/4	+1 1/4	+3.7
NBI INC	21- 61	51 1/2	+3 1/4	+6.7
NCR	39-135	111 3/8	+3 7/8	+3.6
PERKIN-ELMER	21- 46	40	+2 3/4	+7.4
PRIME COMPUTER INC	11- 28	19 7/8	+1	+5.3
QUANTY CORP	21- 46	41 1/2	+1 1/2	+3.7
TANDY COMPUTERS INC	21- 46	41 1/8	+1 1/8	+2.7
TANDY CORP	21- 49	39 1/2	+ 7/8	+2.7
TELEVIDEO SYSTEMS	11- 31	31 1/4	+ 1/4	+0.8
TELXON CORP	5- 16	8 1/8	+ 3/4	+8.0
TEXAS INSTRUMENTS	77- 99	97 1/2	+ 1/2	+0.5
ULTIMATE CORP	6- 20	19 1/2	+1 1/2	+10.0
VECTOR GRAPHICS INC	3- 9	8 3/4	0	0.0
WANG LABS "B"	19- 43	38 1/8	+1 1/8	+3.1
WANG LABS "C"	11- 30	28	+1 1/8	+4.1
XEROX CORP	39- 62	46 1/8	+ 3/4	+1.6
LEASING COMPANIES				
BOOTHE FINANCIAL CP	11- 30	30 1/8	+1	+3.4
CAMERON BRO	7- 20	19 3/8	+1	+2.6
CONTINENTAL INFO SYS	2- 10	9	+ 1/4	+2.7
DPF INC	2- 10	10 1/4	+ 3/4	+7.9
ELECTRONIC INC	15- 21	20 1/8	- 0	0.0
G.A. LEASING	15- 27	26 5/8	+ 3/4	+2.8
COMPONENTS				
ADVANCED MICRO DEV	13- 37	36 7/8	+2 3/4	+80.1
ADV'D MICROMICRO	13- 28	28	0	0.0
ANALOG DEVICES INC	13- 43	34	- 3/4	-2.3
BURLSITE CORP	16- 27	17 7/8	- 3/8	-2.0
DATA.TRON MAGNETICS CP	13- 23	18 7/8	+1	+5.6
TERADYNE	14- 36	30 1/8	+ 3/4	+2.7

CHNG CHNG YEAR/ ANNOTATIONS P-PRESPLIT SPLIT(ON)
L-NOTIONAL; SPLIT(NET) D-NEW- THE-CENTER
B-I-C PRICES ARE BID PRICES AS OF 2 P.M. ED LAST BID
(1) TO NEAREST DOLLAR

	PRICE 1983-84 RANGE (1)	CLOSE MAR 14 1984	CHNG NET MARKET	CHNG PCT CHANGE
SOFTWARE & EDP SERVICES				
ADVANCED COMP PROD	1- 8	8 3/4	- 1/2	-10.3
ADVANCED SYSTEMS INC	19- 33	31	+1 3/4	+6.7
APS COMPUTING INC	7- 22	21 3/4	+1	+4.2
ASHTON-TATE	14- 68	67 1/4	+2 3/4	+11.2
BANCTEC INC	7- 20	19 1/8	- 1/8	-0.7
BANKTECH INFO CORP	6- 21	9	- 1/4	-2.7
BRICKS 4870 INC.	6- 27	26	- 1/8	-2.0
BMC COMPUTER SYSTEMS	6- 21	19	+1	+5.1
BOTHWYRE CORP INC	1- 7	7 1/8	- 3/8	-12.0
AUTOMATIC DATA PROC	27- 41	39 3/4	+2	+5.3
CDC COMPUTER SERV.	9- 17	16	0	0.0
COMPUTER ASSOC INT'L	6- 38	36 3/4	+	0.0
COMPUTER HORIZONS	6- 20	19	- 1/4	-1.3
COMPUTER NETWORKS	1- 3	2 1/2	-	0.0
COMPUTER RESOURCES	1- 5	4 3/4	- 1/4	-5.0
COMPUTER SCIENCES	19- 39	38	- 1/4	-0.6
COMPUTER TASK GROUP	6- 22	19 1/2	+ 1/2	+2.6
COMPUTER ASSOC	7- 23	8 3/4	- 1/4	-10.3
COMPUTERVISION	7- 20	9 3/4	- 1/4	-2.5
COMPUTONE CORP	1- 3	2 1/4	- 1/4	-10.0
CONSULT CORP	5- 21	19 1/2	+ 1/2	+2.6
CRONEMCO	7- 14	8 1/8	+ 1/8	+1.6
CULLINET SOFTWARE	12- 35	35 1/2	+1 1/8	+3.3
CYCARE SYSTEMS INC	1- 27	17	- 1/8	-1.4
ELECTRONIC DATA SYST	19- 69	68 3/8	0	0.0
ADAM SYSTEM INC	14- 37	34 1/2	+ 1/2	+0.1
EXECUTIVE ELECTRIC SY	3- 9	8 1/8	+1	+3.0
FTC CORP	1- 3	2 7/8	+ 1/8	+4.6
INFORMATICS INC	14- 44	43 1/4	+ 3/4	+1.8
INFOTYPES SYSTEMS COR	1- 4	3 3/4	-	-4.0
KRANZ ASSOCIATES	1- 10	7 3/4	- 1/4	-3.1
LEXICON	9- 21	20 1/2	+ 1/2	+2.5
MDI ADMINISTRATORS	1- 5	4 3/4	+ 3/4	+1.1
MDT 401 CORP INC	25- 55	52	-	0.0
MATHEMATICAL APP SY	1- 3	2 1/2	-	0.0
MICRO SYSTEMS INC	14- 34	34 1/4	+ 1/4	+0.7
MONROE-HOUSE CP	6- 22	20 1/4	+ 1/2	+2.5
NATIONAL DATA CORP	7- 20	17 3/4	+ 1/2	+2.9
ON-LINE SOFTWARE INT	7- 23	22 1/2	+ 1/2	+2.3
PANSOPHIC SYSTEMS	3- 10	10 3/4	-	0.0
PLANNING RESEARCH	1- 3	2 1/8	+ 1/8	+6.2
POLICY DATA SYSTS CP	19- 38	34 3/4	+1 1/4	+3.8
PROGRAMMING & SYS	11- 0	0	- 3/4	+5.8
REYNOLDS & REYNOLD	19- 33	30 3/4	+1 1/2	+5.1
SEI CORP	11- 30	30	+ 1/4	+0.8
SHARED MEDICAL SYST	19- 33	33 1/2	- 1/8	-1.8
SCIENTIFIC COMPUTERS	2- 11	2 1/2	0	0.0
SOFTWARE AG	7- 17	16 1/2	+ 1/2	+3.0
TYMSHARE INC	12- 60	46 1/4		0.0
UNI CORP	7- 19	18 1/4	0	0.0
WALT CORP	7- 17	8 1/4	0	0.0
PERIPHERALS & SUBSYSTEMS				
AM INTERNATIONAL	7- 7	3 1/4	-	-1.0
CHARTHOUSE ACCESS	7- 19	15	- 3/4	-4.7
AUTO-TROL TECHNOLOGY	7- 28	12 7/8	+ 3/8	+3.0
DAMCTRC INC	7- 29	8 3/4	-	-10.2
DECNIED INT'L	7- 18	8 1/8	- 1/4	-2.7
DELTA DESIGNS & MEM	7- 28	26 3/8	+1 1/4	+4.7
DAMRIC CORP	1- 3	1 3/4	- 1/4	-10.0
DENTRONICS DATA CORP	7- 15	13	- 1/2	-3.6
DIGI CORP	7- 20	8 3/8	- 1/8	-1.4
DIGITRONICS	7- 20	8	+ 1/8	+1.6
COMPUTER DEVICES INC	1- 21	3 1/4	0	0.0
COMPUTER TRANSCIENS	3- 12	3 1/4	+ 1/8	+4.0
COMPUTERVISION CORP	14- 60	58 3/4	+ 3/8	+0.6
CRONIC CORP	19- 38	18 1/8	+ 3/4	+4.3
DATACHECKS CORP	25- 41	33 1/4	+1 1/4	+3.9
DATAPAK CORP	3- 8	5 3/4	+ 1/8	+2.2
DATA SYSTEM CORP	13- 43	35 1/2	0	0.0
GTRON INC	7- 19	7 1/2	+ 3/8	+5.0
INTISYS DATA CORP	1- 5	1 1/2	- 1/8	-7.1
SECUTEL-ULTRITT	1- 10	8 1/8	+ 7/8	+10.1
ELECTRONIC F & S	1- 11	8 3/4	0	0.0
EXABYTE INC	25- 41	31 3/4	- 1/4	-0.8
FANSTEL CORP	7- 28	21 3/4	-	-0.0
FOUNDATION MEDICAL	19- 38	31 1/8	+ 1/8	+0.4
GERBER SYS CORP INC	6- 20	17 1/2	- 3/4	-4.1
GENERAL TECHNOLOGY INC	1- 3	2 1/4	-	0.0
HEWLETT CORP	1- 10	10 3/4	+2 3/8	+28.0
ICOT CORP	6- 20	8 1/4	+ 1/8	+1.5
IMPERATOR INTL INC	19- 33	12 7/8	+1	+8.4
INFORMATION RESOURCE	1- 12	8	0	0.0
INTEL CORP	11- 28	26 3/4	+1 1/2	+5.3
ISL SYSTEMS INC	1- 10	3 1/2	- 1/4	-3.5
JERRY ELECTRONICS	1- 4	3 3/4	- 1/4	-3.2
KEYBOARD CORP	1- 5	3 1/4	- 1/4	-3.7
KEI DATA CORP	19- 37	35 3/4	- 1/8	-0.3
KENDALL CORP	1- 3	2	- 1/8	-5.9
KEYBOARD SYSTEMS CORP	1- 4	3 1/4	+1 3/8	+4.2
KO ENGINEERING PHILIPS	1- 4	3 1/8	+ 1/8	+4.0
KEYSTONE TELECOM LAB	23- 46	39 1/2	+1	+2.6
KINEX	1- 5	4	0	0.0
KRANSPRE CORP	1- 5	3 1/4	+ 3/4	+0.1
KENNEL CORP	1- 15	12 1/2	+ 1/2	+4.2
MACHINE ANDERSON INC	7- 17	12 3/4	- 3/4	-5.6
MARKET CO (NOT)	25- 41	39	+1 3/4	+4.7
MINTRONIX INC	3- 9	8 1/8	+ 1/8	+1.6
MINTEX CORP	1- 3	2 1/4	+ 1/8	+5.4
MINTRONICS CO	27- 49	47 1/2	+ 1/2	+1.0
MICROMINTUM CORP	4- 17	11 3/8	+ 1/8	+1.1
MOLH CORP	19- 60	38 3/4	+ 3/4	+2.0
MONITOR ASSOCIATES	28-100	28 1/4	+6	+29.2
MOSH 6870	1- 2	1 3/4	0	0.0
MOSH-TRON CORP	11- 28	11 1/2	- 1/2	-4.2
MOSINTIFIC ATLANTA	13- 30	11 1/2	- 1/8	-0.7
MYMOMIC TECHNOLOGY	11- 28	11 1/2	- 1/8	-1.0
MYRES MOTATRONICS	3- 7	3 1/8	- 1/8	-3.8
MYSTEMS & COMP GROP	7- 20	19	+ 1/8	+0.6
T SAN INC	7- 17	3 3/4	- 1/8	-3.2
TAN PRODUCTS IN	1- 3	2 1/2	- 1/8	-4.8
LANDMAN CORP	1- 5	3 3/4	- 1/8	-3.2
INC INC	1- 3	2 1/8	- 1/8	-5.6
TOMPSON INC	1- 3	2 1/8	- 1/8	-5.6
TELEX	9- 17	13 3/4	+ 1/4	+1.8
TERADATA SYSTEMS CP	1- 17	8 1/8	- 3/4	-8.5
TIMEPLEX INC	11- 28	18	+ 3/8	+2.1
TRIAL TECHNOLOGY	9- 17	12 1/2	- 3/4	-5.8
SUPPLIES & ACCESSORIES				
ANDERSON JAC PRODS	7- 22	20	- 3/4	-3.6
BARRY WRIGHT	1- 10	8	+1	+14.2
DATAPLEX PRODUCTS INC	13- 27	25	- 1/4	-0.9
DATUS MOS. PRODS	1- 3	1 1/2	- 1/8	-5.0
3D COMPANY	25- 51	39 3/4	+ 1/4	+0.6
ANDEC CORP LTD	25- 51	27 1/2	0	0.0
STANDARD REGISTER	11- 28	28 3/4	+ 1/4	+0.8
WALLACE MOS PRODS	11- 28	28 1/8	+ 1/8	+0.4



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